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6099/344

The  
Patent  
Office

09/80624

INVESTOR IN PEOPLE

The Patent Office  
Concept House  
Cardiff Road  
Newport  
South Wales  
NP10 8QQ

4  
**PRIORITY  
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REC'D 17 NOV 1999

WIPO PCT

I, the undersigned, being an officer duly authorised in accordance with Section 74(1) and (4) of the Deregulation & Contracting Out Act 1994, to sign and issue certificates on behalf of the Comptroller-General, hereby certify that annexed hereto is a true copy of the documents as originally filed in connection with the patent application identified therein.

In accordance with the Patents (Companies Re-registration) Rules 1982, if a company named in this certificate and any accompanying documents has re-registered under the Companies Act 1980 with the same name as that with which it was registered immediately before re-registration save for the substitution as, or inclusion as, the last part of the name of the words "public limited company" or their equivalents in Welsh, references to the name of the company in this certificate and any accompanying documents shall be treated as references to the name with which it is so re-registered.

In accordance with the rules, the words "public limited company" may be replaced by p.l.c., plc, P.L.C. or PLC.

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Signed

Dated 29 October 1999

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# Request for grant of a patent

(See the notes on the back of this form. You can also get an explanatory leaflet from the Patent Office to help you fill in this form)



The Patent Office

Cardiff Road  
Newport  
Gwent NP9 1RH

1. Your reference	J00041093GB	L 16OCT98 E397767-1 D02829 PA1/7700 0.00 9022545.1
2. Patent application number (The Patent Office will fill in this part)	<b>9822545.1</b>	
3. Full name, address and postcode of the or of each applicant (underline all surnames)	BRITISH AIRWAYS PLC Waterside (HB A3) PO Box 365 Harmondsworth West Drayton UB7 0GB	
Patents ADP number (if you know it)		
If the applicant is a corporate body, give the country/state of its incorporation	04059655002	
4. Title of the invention	A SEATING UNIT	
5. Name of your agent (if you have one)	R.G.C. JENKINS & CO. 26 Caxton Street London SW1H 0RJ	
"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)		
Patents ADP number (if you know it)	950001 ✓	
6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (if you know it) the or each application number	Country	Priority application number (if you know it)
		Date of filing (day / month / year)
7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application	Number of earlier application	Date of filing (day / month / year)
8. Is a statement of inventorship and of right to grant of a patent required in support of this request? (Answer 'Yes' if: a) any applicant named in part 3 is not an inventor, or b) there is an inventor who is not named as an applicant, or c) any named applicant is a corporate body. See note (d))	YES	

Patents Form 1/77

9. Enter the number of sheets of any of the following items you are filing with this form. Do not count copies of the same document

Continuation sheets of this form

Description 2

Claim(s)

Abstract

Drawing(s) 41 x 41

10. If you are also filing any of the following, state how many against each item.

Priority documents

Translations of priority documents

Statement of inventorship and right to grant of a patent (Patents Form 7/77)

Request for preliminary examination and search (Patents Form 9/77)

Request for substantive examination (Patents Form 10/77)

Any other documents (please specify)

11.

I/We request the grant of a patent on the basis of this application.

Signature

R.G.C. Jenkins & Co.

Date

R.G.C. JENKINS & CO. 15 Oct 1998

12. Name and daytime telephone number of person to contact in the United Kingdom

GEORGE A. WHITTEN

Tel: 0171 - 931 7141

**Warning**

*After an application for a patent has been filed, the Comptroller of the Patent Office will consider whether publication or communication of the invention should be prohibited or restricted under Section 22 of the Patents Act 1977. You will be informed if it is necessary to prohibit or restrict your invention in this way. Furthermore, if you live in the United Kingdom, Section 23 of the Patents Act 1977 stops you from applying for a patent abroad without first getting written permission from the Patent Office unless an application has been filed at least 6 weeks beforehand in the United Kingdom for a patent for the same invention and either no direction prohibiting publication or communication has been given, or any such direction has been revoked.*

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- If you need help to fill in this form or you have any questions, please contact the Patent Office on 0645 500505.
- Write your answers in capital letters using black ink or you may type them.
- If there is not enough space for all the relevant details on any part of this form, please continue on a separate sheet of paper and write "see continuation sheet" in the relevant part(s). Any continuation sheet should be attached to this form.
- If you have answered 'Yes' Patents Form 7/77 will need to be filed.
- Once you have filled in the form you must remember to sign and date it.
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## A SEATING UNIT

This invention relates to a seating unit. More specifically, but not exclusively, the invention relates to an aircraft seat. The invention also relates  
5 to an aircraft cabin.

In our International patent application (Publication No. WO 96/18537) there is described a seating unit which comprises a primary seat and a secondary unit. The seating unit can be easily manipulated from a 'seating configuration' wherein the primary seat functions as a seat to a 'bed  
10 configuration' wherein the primary seat co-operates with the secondary unit to form a flat sleeping surface. For increased passenger privacy each seating unit is contained within its own fixed housing.

The seats described in WO 96/18537 are currently being used in our first class cabins. The ease of manipulation of each seating unit from a 'seat  
15 configuration' to a 'bed configuration' within a fixed housing, and also the staggered arrangement of the units helps a level of comfort and privacy which  
has set an industry benchmark.

---

In most aircraft the business class cabin is fitted with large reasonably spaced apart seats. However, such seats are not designed to lie flat and do not  
20 provide passengers with as much privacy as they would ideally prefer.

Despite their success in first class cabins the seating units described in WO 96/18537 are not suitable for use in business class cabins. This is

because fitting such seats in a business cabin would mean having to reduce the overall seating capacity of the cabin to an uneconomical level.

Seating units embodying the invention are shown in the accompanying figures. The figures show two types of seating units. Each of the seating  
5 units is usable simply as a seat and is also usable as a bed.

When the seating units are arranged in cabin layout as shown in some of the figures then the seating capacity of the cabin is substantially the same as that of traditional business class cabins. Furthermore, the design of the seating units combined with the arrangement in the cabin ensures that each  
10 passenger has an acceptable amount of privacy.

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## La Chaise

If you had to spend a lot of time in one place, you would want that space to be like this - somewhere you can spread out and get serene; where nobody bothers you unless you invite them in; where you feel constrained in no way at all.



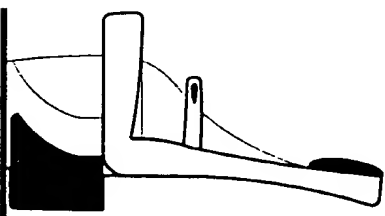
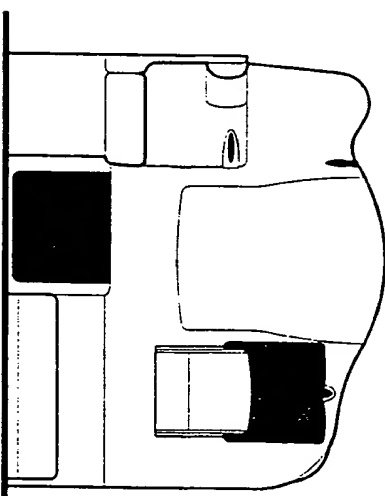
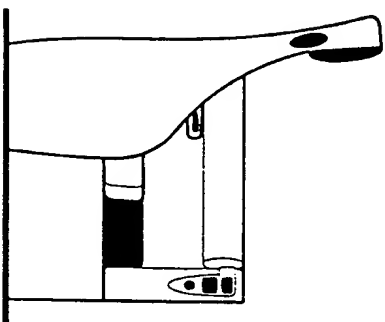
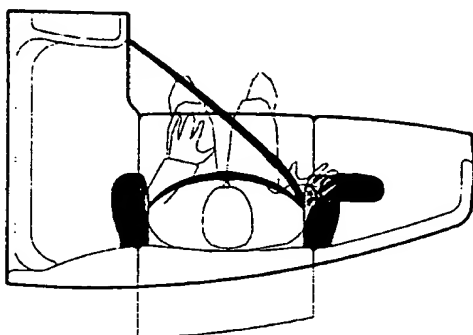
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## General Arrangement of La Chaise

Features include...

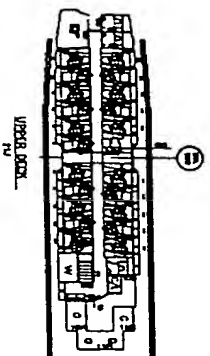
- clear bed length between 62 and 70"
- seat recline better than economy
- single piece bed extension or footrest
- fold-away armrests
- adjustable headrest
- ample storage within your space
- large table pocketed in seat back
- separate drinks table
- restraints available wherever you sit
- IFE on articulated arm
- reading light



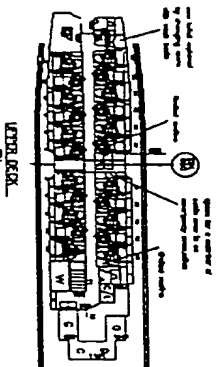
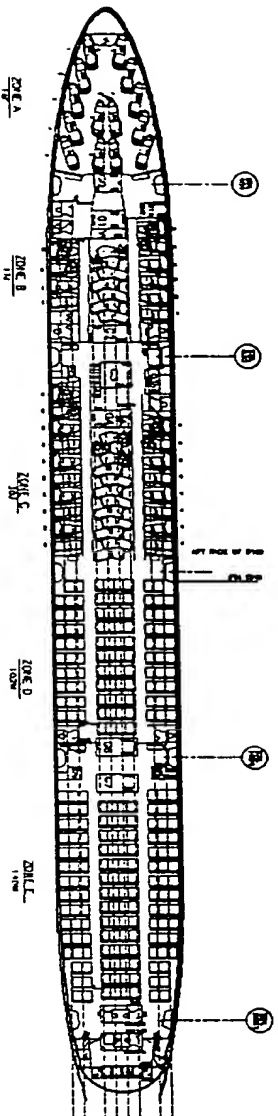
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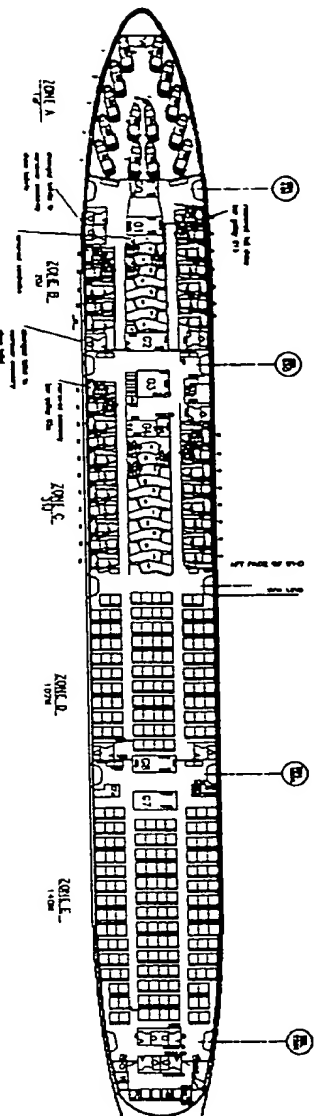




747-400, 75J configuration  
15 inch legroom  
no changes to monuments  
14F / 68J / 242M (324)



747-400, 75J configuration  
15 inch legroom  
radical changes to monuments  
14F / 73J / 242M (329)



## Aircraft Layouts

The 75J configuration is by far the most important to British Airways. Our aim was to match the mix of seats in this configuration.

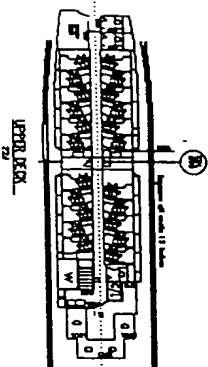
L4 Chaise is larger than the current Club seat - it has to be to achieve a flat bed. So we have had to intelligently move volumes, such as wardrobes, to win back the space and seat counts we need.

Doing this we get 68 of the new chairs in the 747-400. This is immediately possible.

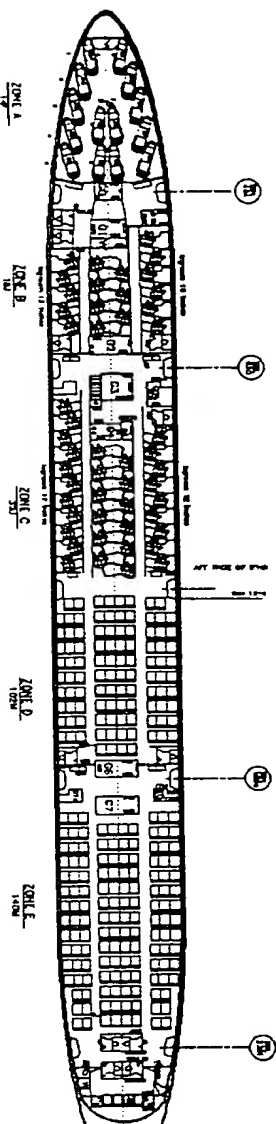
We have gone further, however, to propose changes to monuments that win significantly more space. In this way we can install 73 of the new chairs.

The changes we propose are demanding but, we believe, achievable.

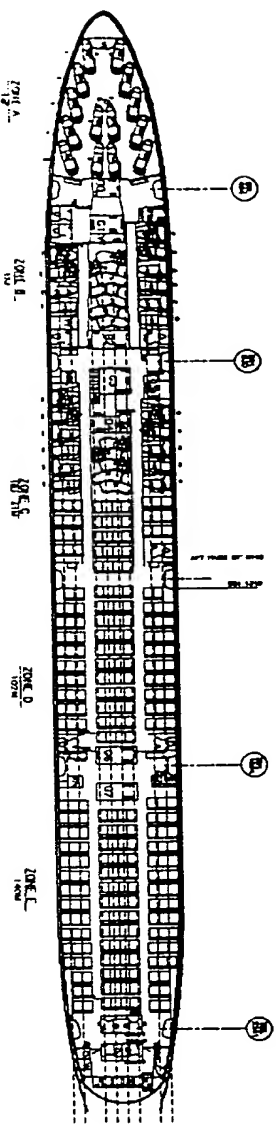
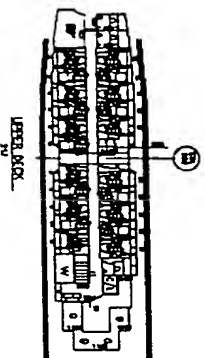




747-400, 75J configuration  
12-14 inch legroom  
no changes to monuments  
14F / 72J / 242M (328)



747-400, 55J configuration  
15 inch legroom  
no changes to monuments  
14F / 54J / 283M (351)



## Aircraft Layout - 747

To further raise the La Chaise seat count we have experimented with reducing the knee room.

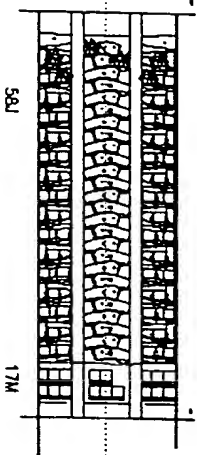
Unfortunately, knee space is below an acceptable Business class value when significant gains are made.

A small proportion of the 747 fleet use the 5J configuration.

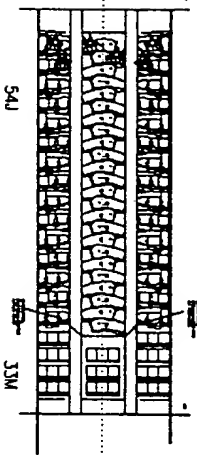
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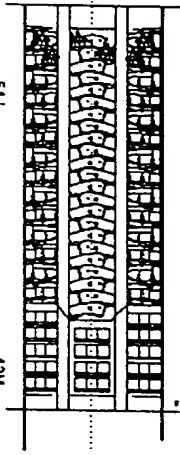




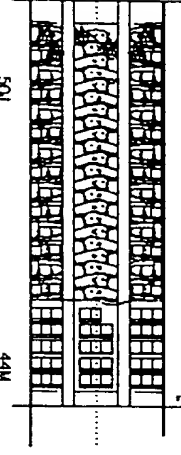
777 - variation 1  
15 inch legroom  
no changes to monuments  
14F / 58J / 142M (214)



777 - variation 2  
15 inch legroom  
no changes to monuments  
14F / 54J / 158M (226)



777 - variation 3  
15 inch legroom  
no changes to monuments  
14F / 51J / 167M (232)



777 - variation 4  
15 inch legroom  
no changes to monuments  
14F / 50J / 169M (233)

## Aircraft Layout - 777

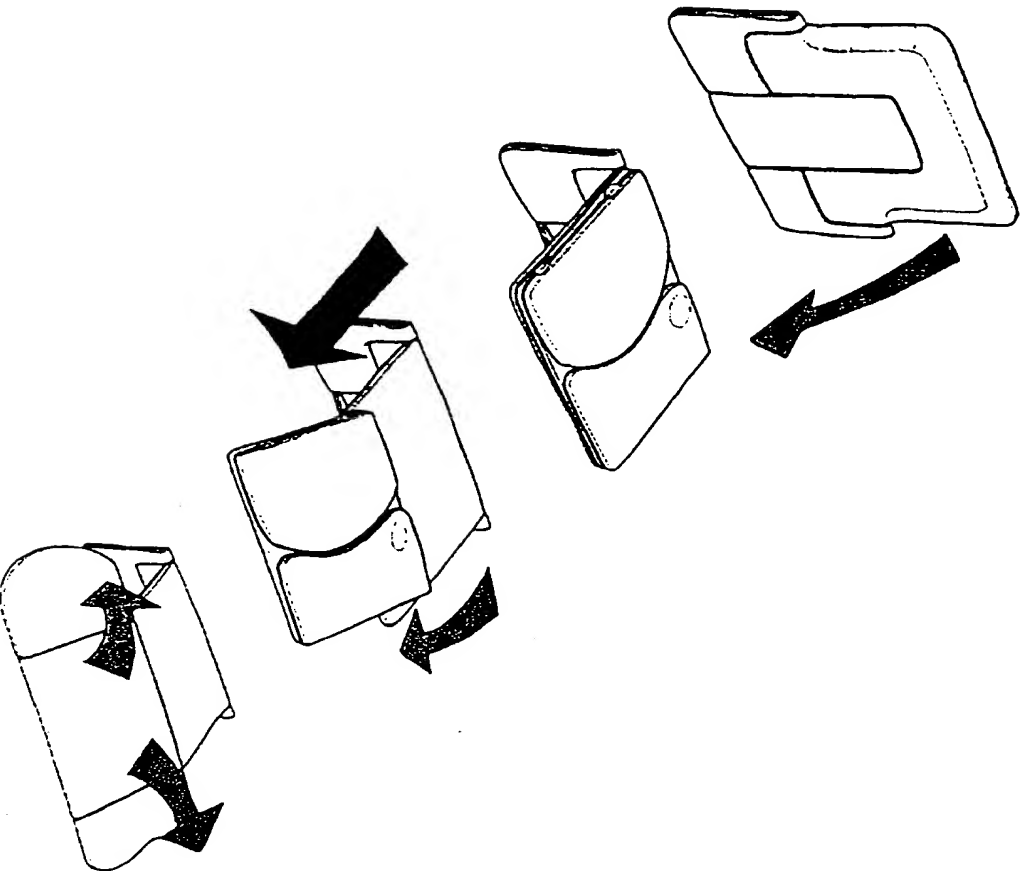
This fleet normally flies with 56 J-class seats.

The Boeing 777 is a very straightforward aircraft in which to install the new chairs. This works against us slightly, in that there are few volumes with which we can be creative to make space.

The variations we propose here have slightly different mixes of J- and M-class seats.

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## Chair details - table

The table is pocketed into the non-moving section of seat back.

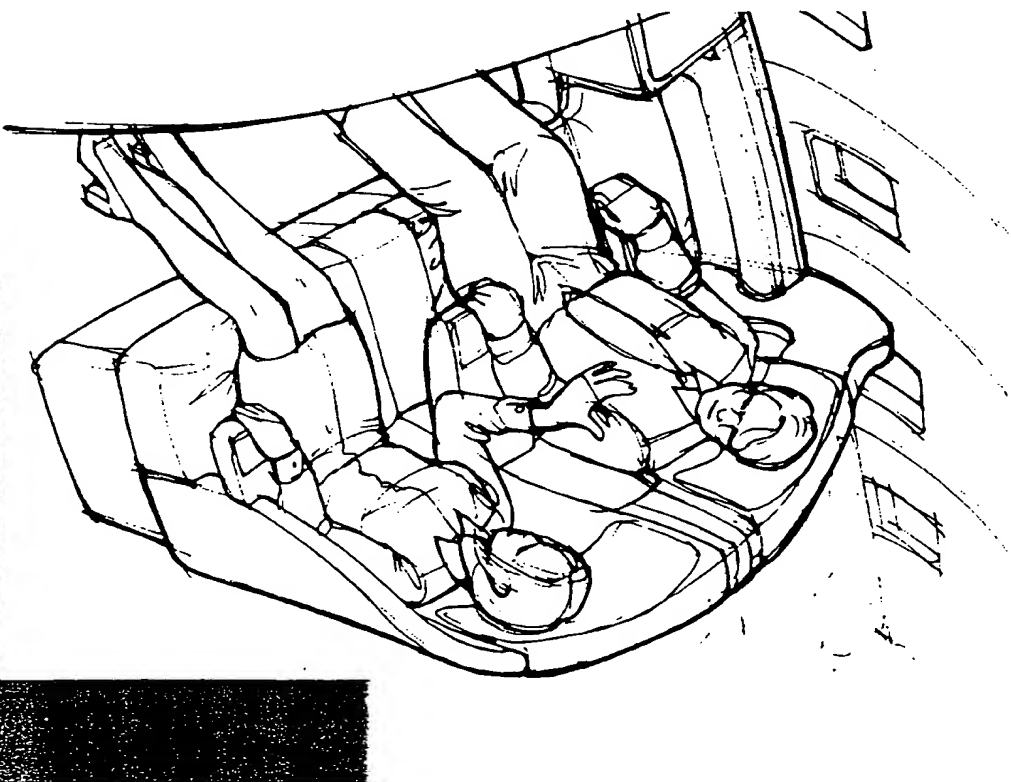
It folds down towards you; it can be pulled towards you and angled to suit; additional flaps fold out to provide ample space.

Simple to use, it will employ conventional sliding mechanisms and composites for strength & lightness.



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## Chair details - two-seater

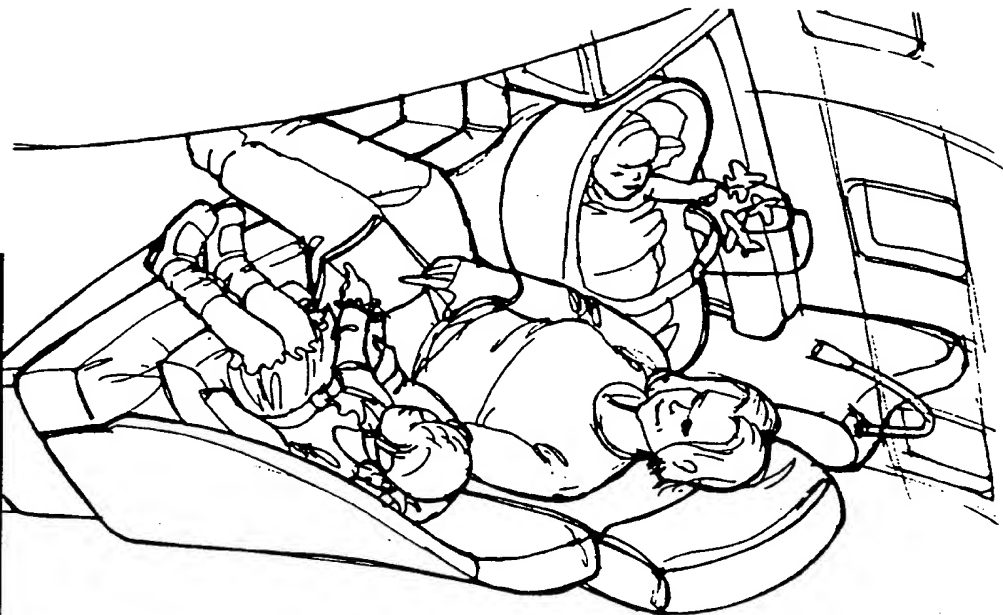
The window seats are particularly suitable for the development of a two-seater variant.

In this way we can almost double the capacity of Business class, and carry a new 'Business Buddy' class.

La Chaise allows temporary occupation by a friend or colleague. This seat enables two to travel together in comfort.

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## Chair details - children

There is a significant sector of Business class travellers who are accompanied by children.

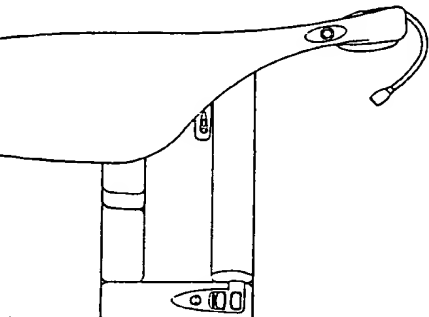
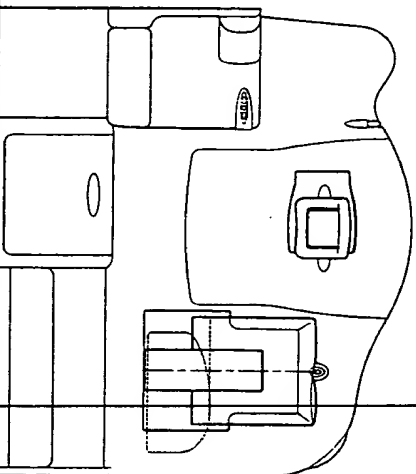
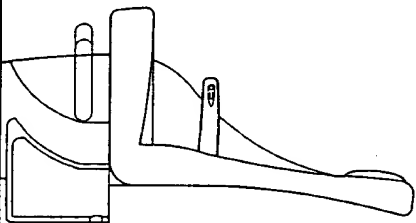
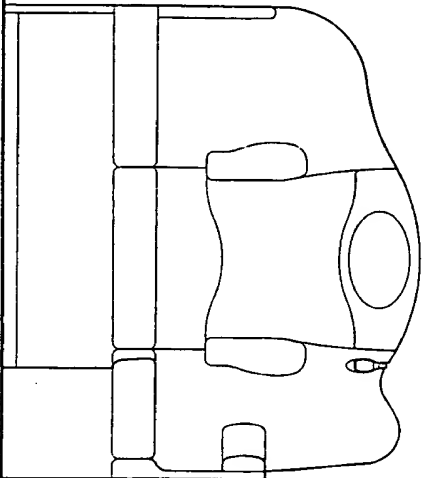
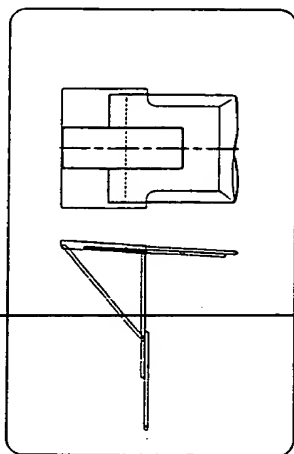
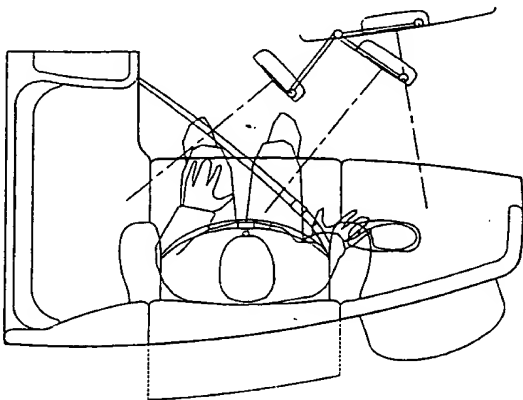
La Chaise is particularly suited to the inclusion of redesigned cots and booster seats. The feel of enclosure and privacy makes looking after young children less stressful.



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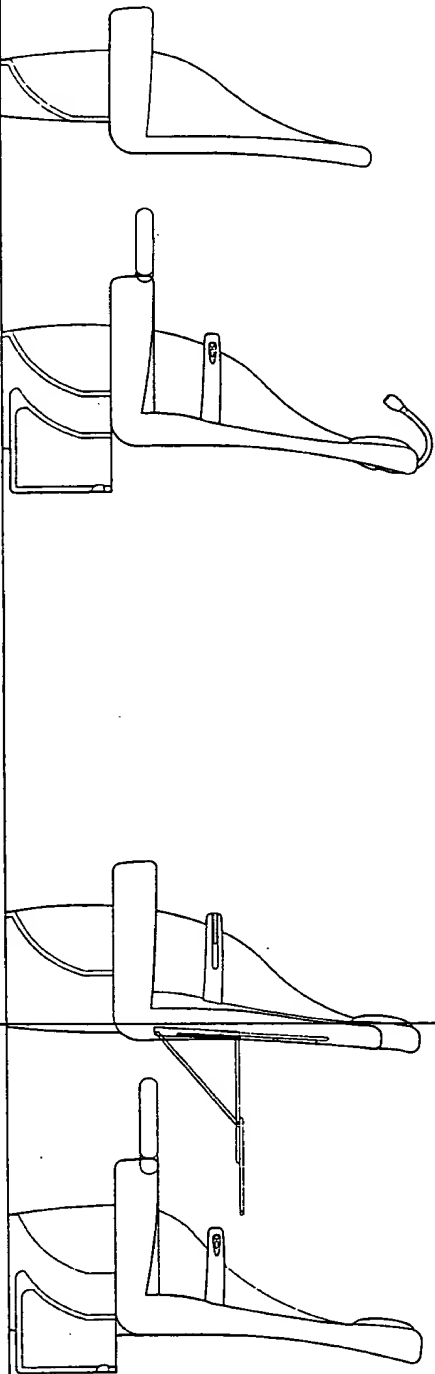
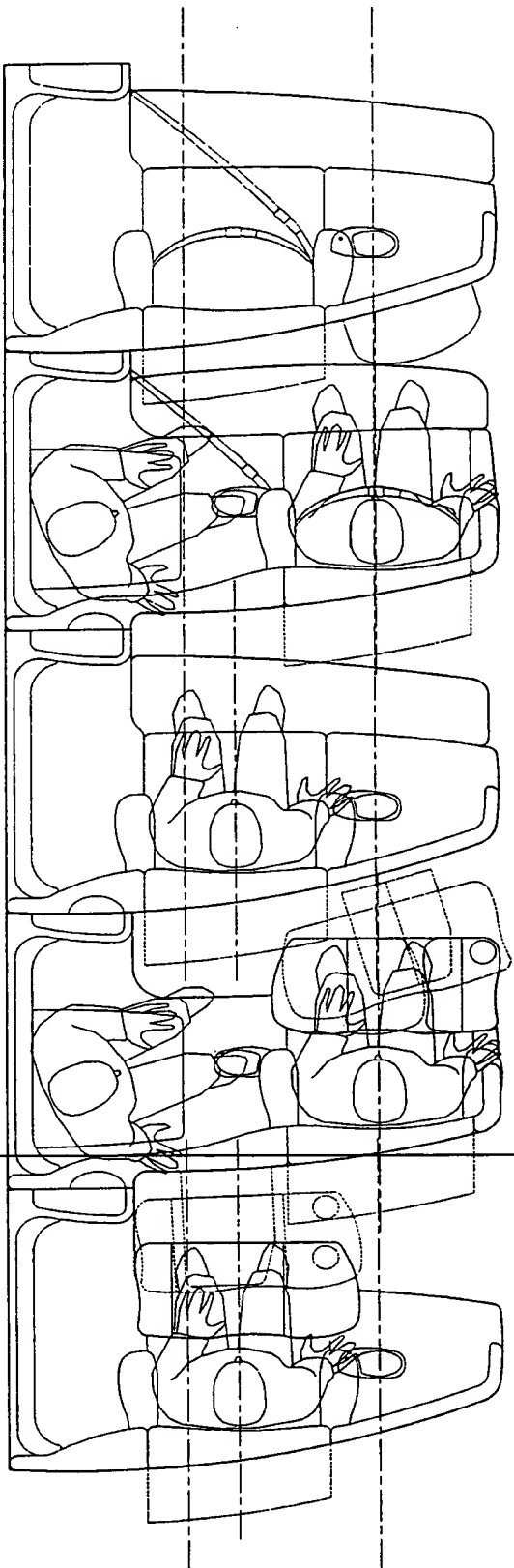
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 Project: NEW CLUB WORLD SEATING  
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 Scale: 1:8  
 Size: A1  
 Drawn: MARC TANNER  
 Date: 12th Oct 1998

NOTE - This drawing  
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 design concept and  
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IDEO Product Development Euro  
 7/8 Avenue Park, London, NW11 1PQ  
 Tel: 020 8311 4822  
 Fax: 020 8311 4822  
 E: info@ideo.com

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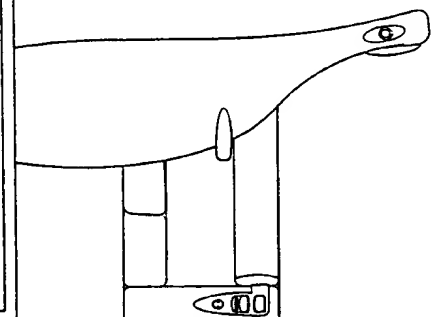
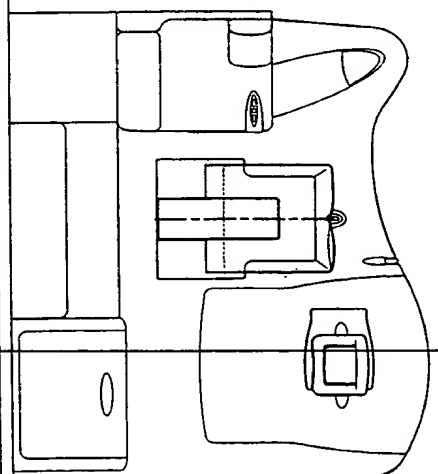
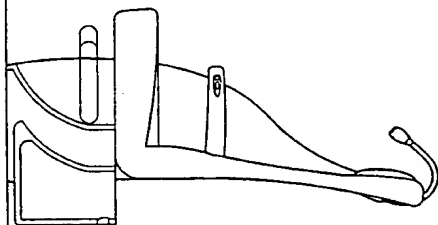
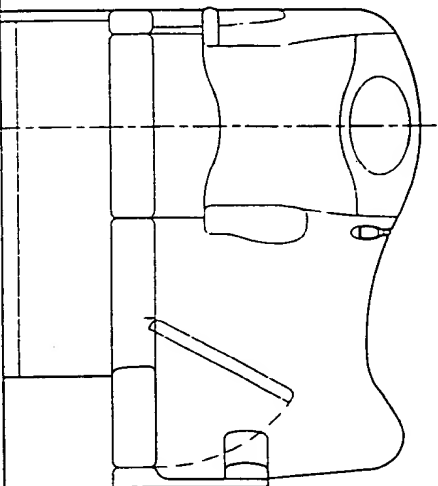
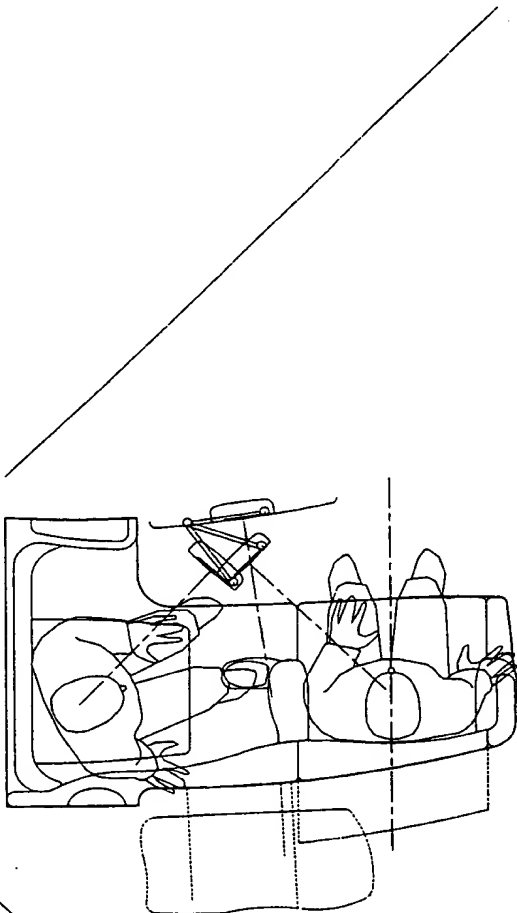
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 Size: A1  
 Drawn: MARG TANNER  
 Date: 12th Oct 1998

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DEO Product Development, Europe  
 7th Floor, P.O. Box 1, London NW1 1GP  
 Tel: +44 (0) 20 7 462 1119  
 Fax: +44 (0) 20 7 462 2016  
 E: m.tanner@deo.co.uk

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DRG NO. BAP202-010

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Project: NEW CLUB WORLD SEATING

Title: WINDOW SEAT A

Scale: 1:8

Size: A1

Drawn: MASC TANNER

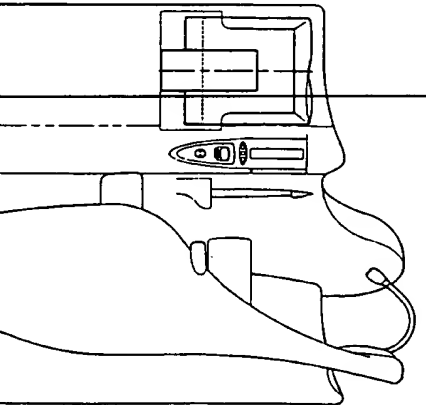
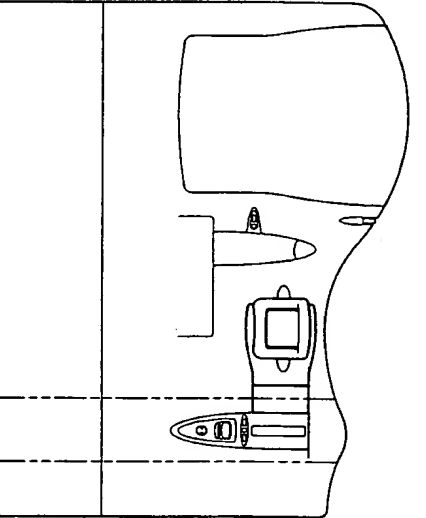
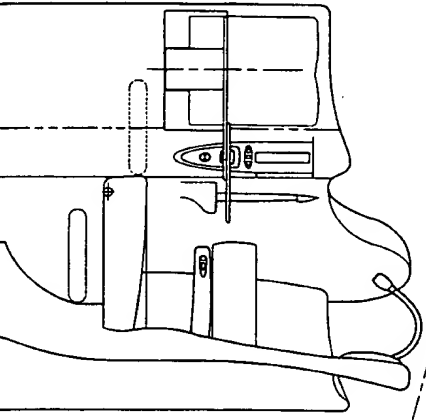
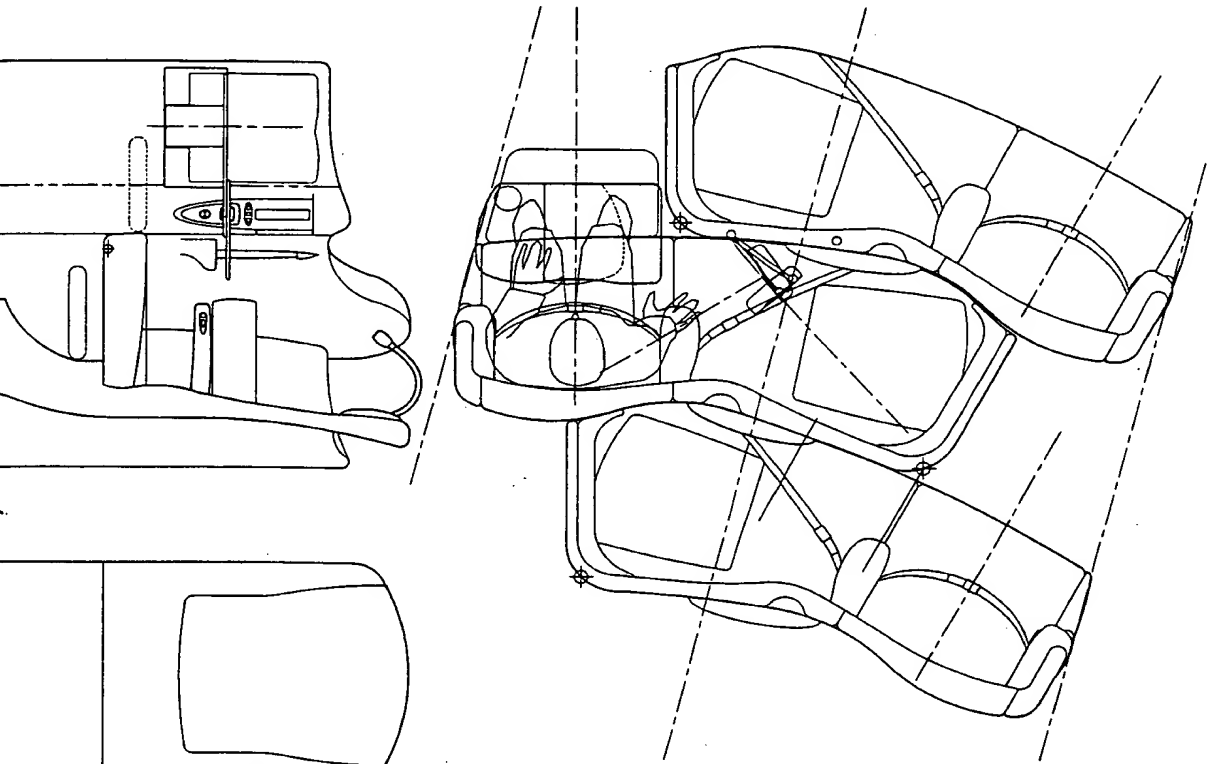
Date: 12th Oct 1998

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☐ T & E B1/1 400 110  
☐ F & E B1/1 400 110  
☐ E number 01/2000

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DRG NO. BAP202-013

Client BRITISH AIRWAYS

Project NEW CLUB WORLD SEATING

Title CENTRE SEAT

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Size A1

Drawn by

MARC TANNER

for production purposes

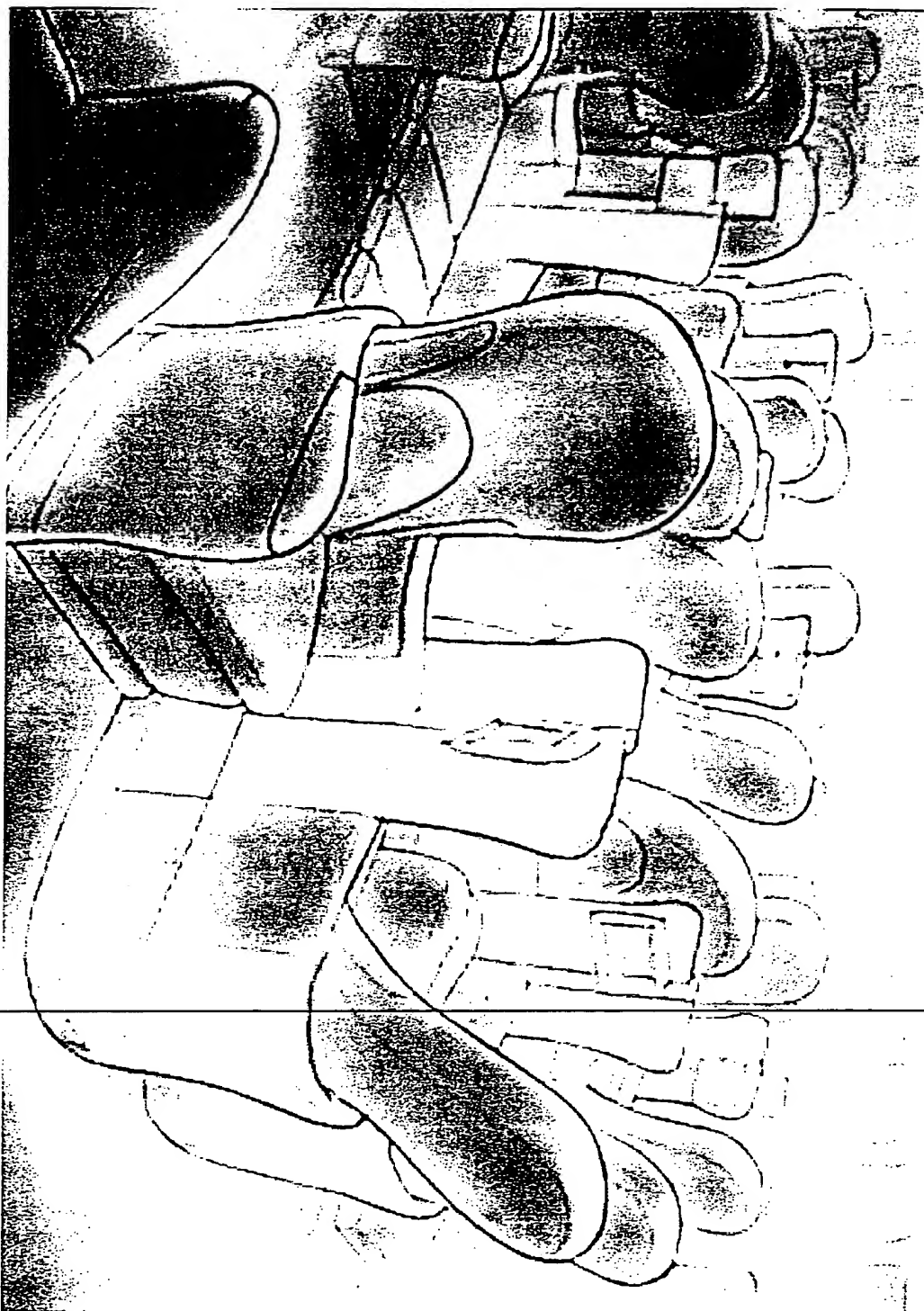
Date 12th Oct 1998

DEO Product Development Europe  
7/8 Jervis St., London NW1 1JN  
Tel: 020 7111 8811  
Fax: 020 7111 8812  
E: info@deo.co.uk

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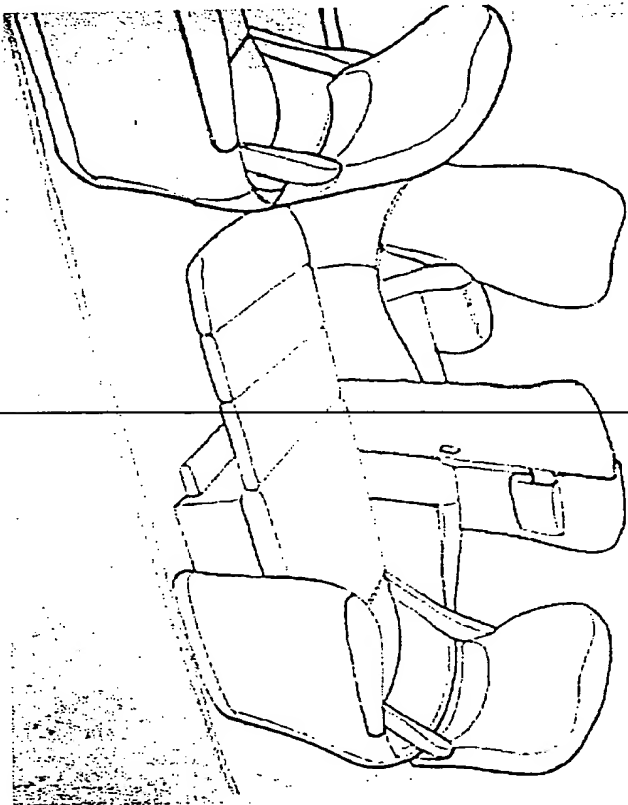
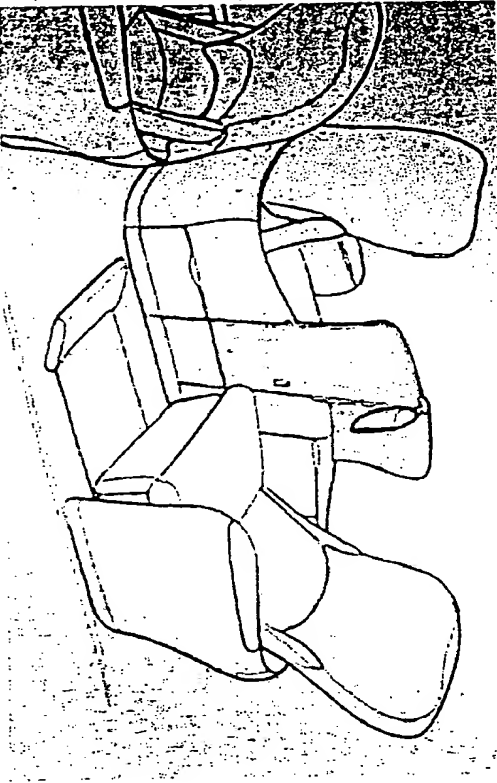
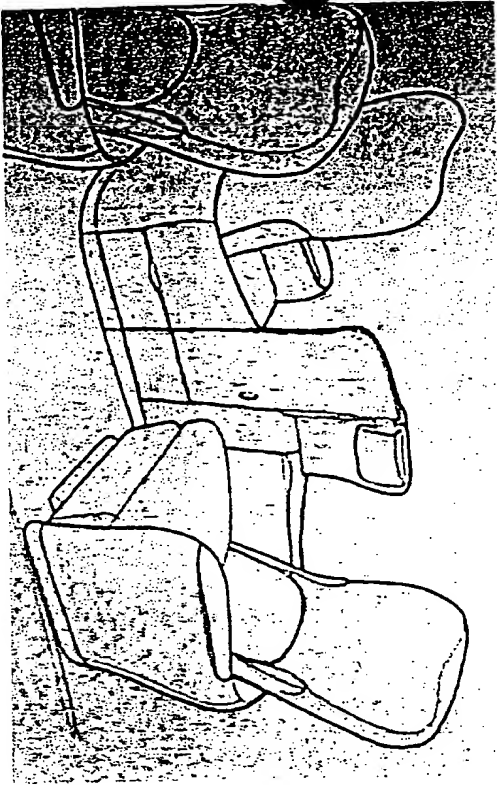




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Sketch development



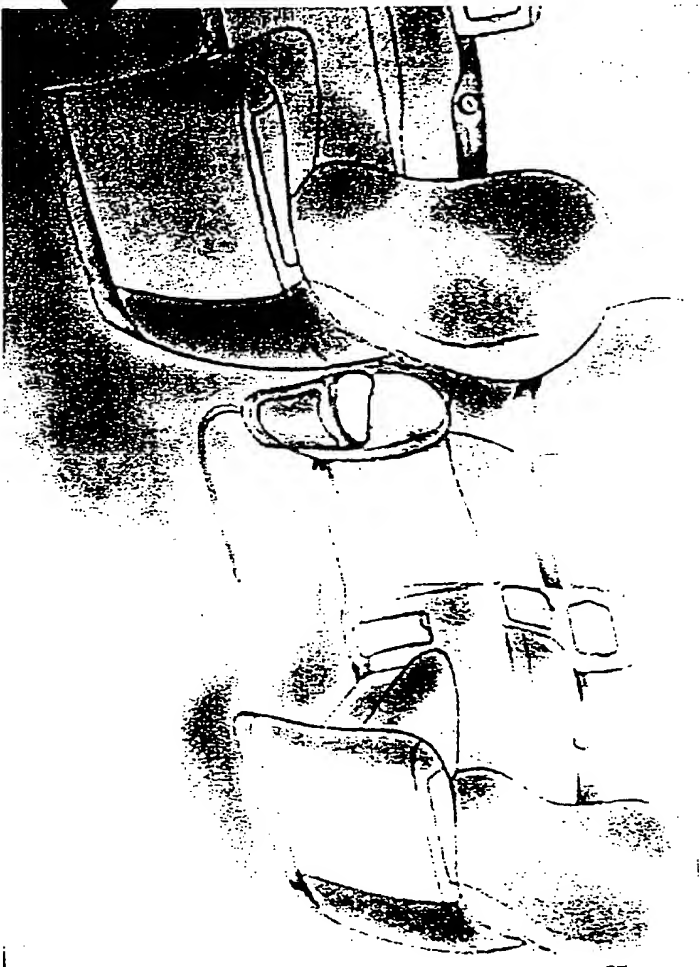
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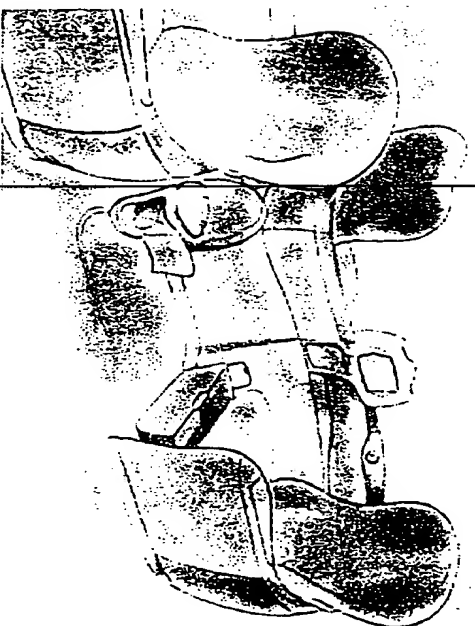


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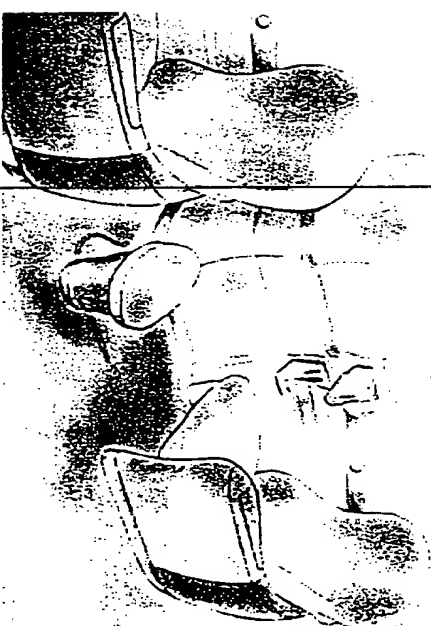
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Arrival



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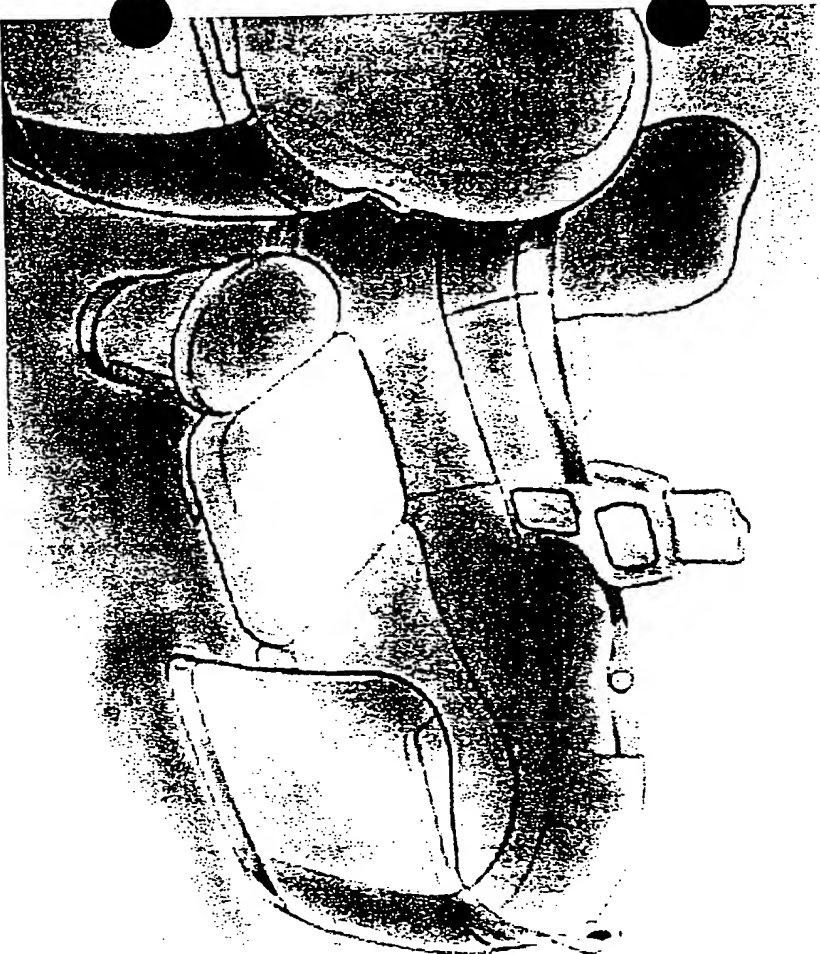


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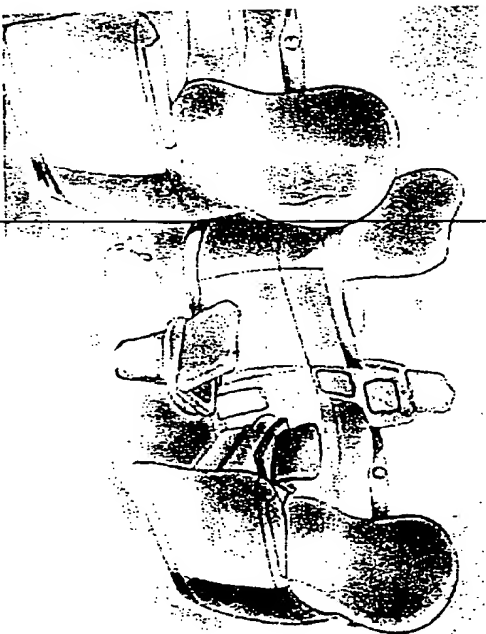
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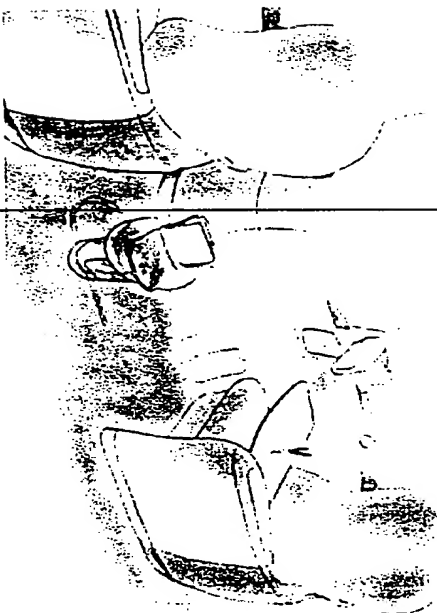




**Sleeping**



**Working**



**Dining**

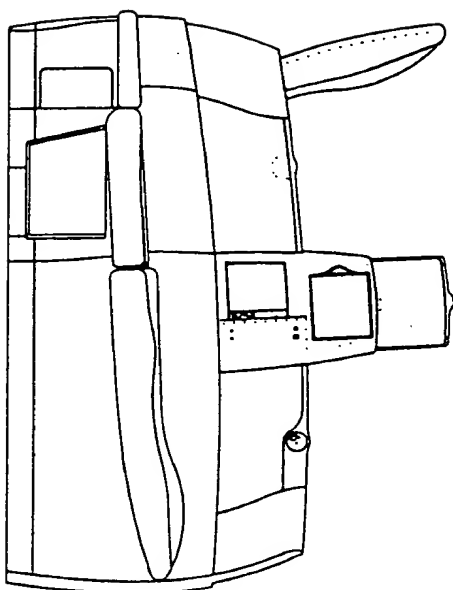
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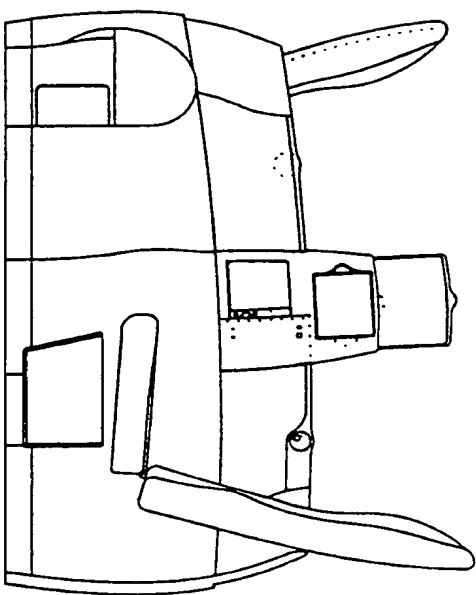
SECTION VIEWS SHOWING SEAT RECLINE POSITIONS (SCALE 1:10)

• BA CREATIVE PITCH II CONTINUATION • 13 OCTOBER 1998

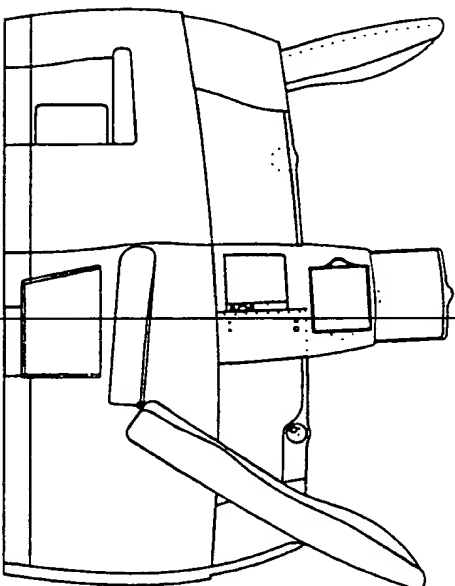
FULL RECLINE TO BED MODE



LANDING AND TAKE OFF MODE



RELAXING RECLINE MODE



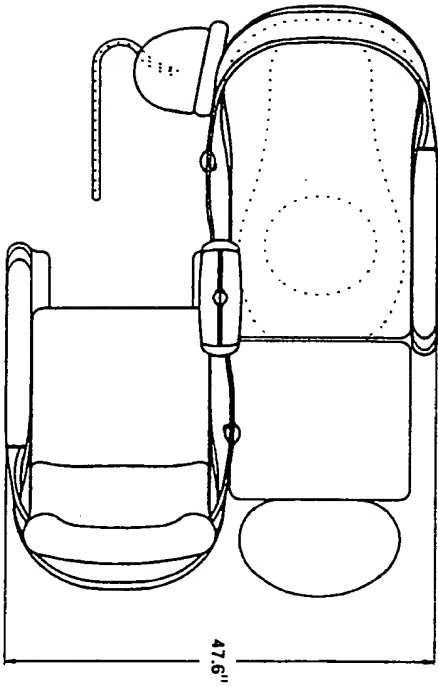
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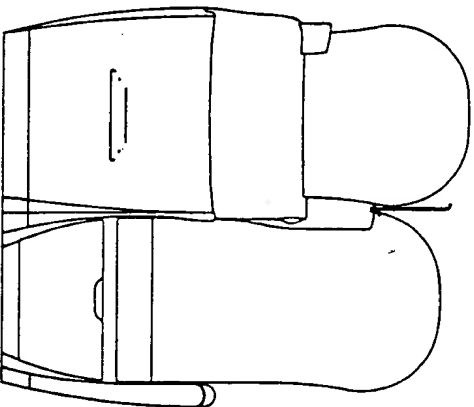
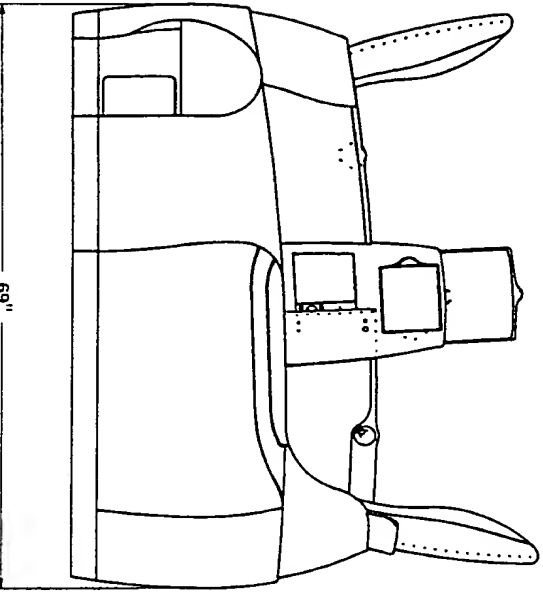
GENERAL ARRANGEMENT VIEWS (LANDING & TAKE OFF • BED MODE)

• BA CREATIVE PITCH II CONTINUATION • 13 OCTOBER 1998

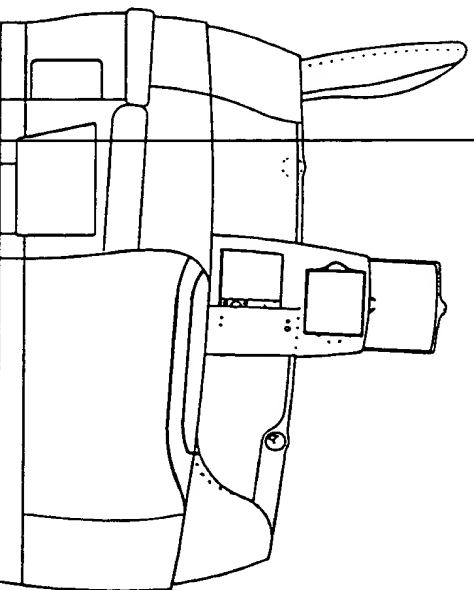
AFT FACING SEAT



FORE FACING SEAT (LANDING & TAKE OFF)



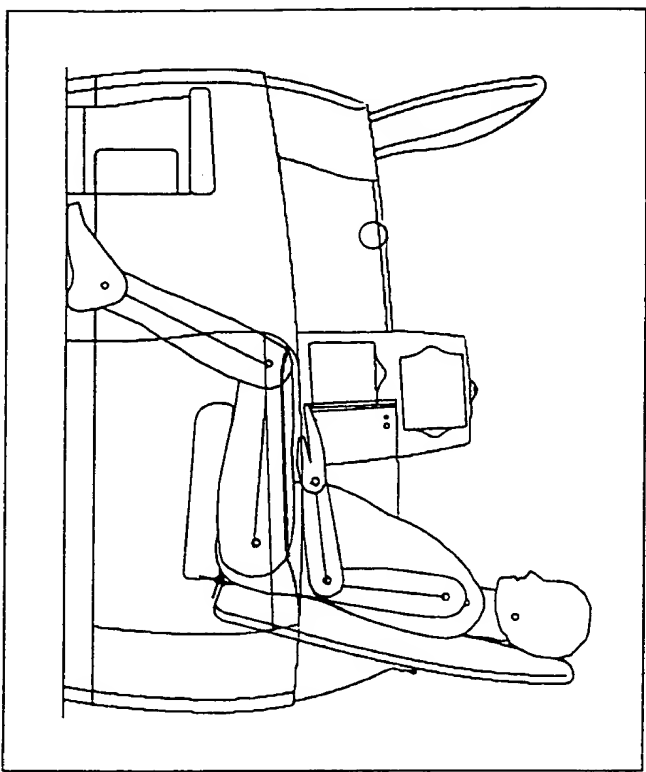
AFT FACING SEAT (BED MODE)



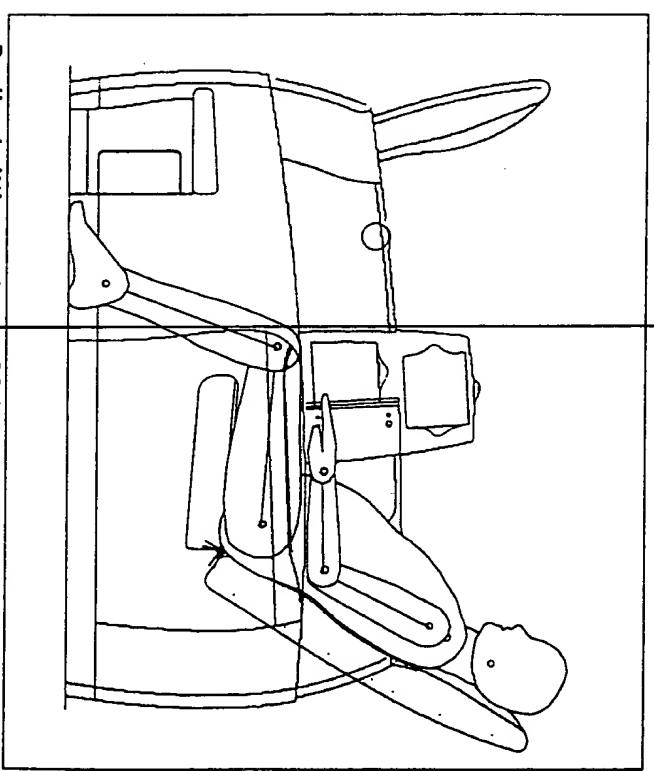
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# sitting postures - 1



Take-off and landing – non-reclined sitting posture - 99th percentile North American male

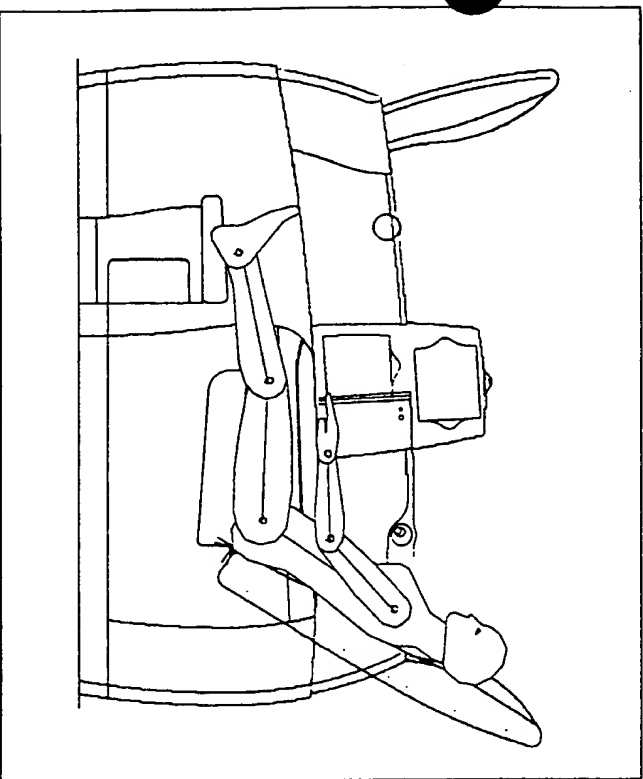


Reclined sitting posture - 99th percentile North American male

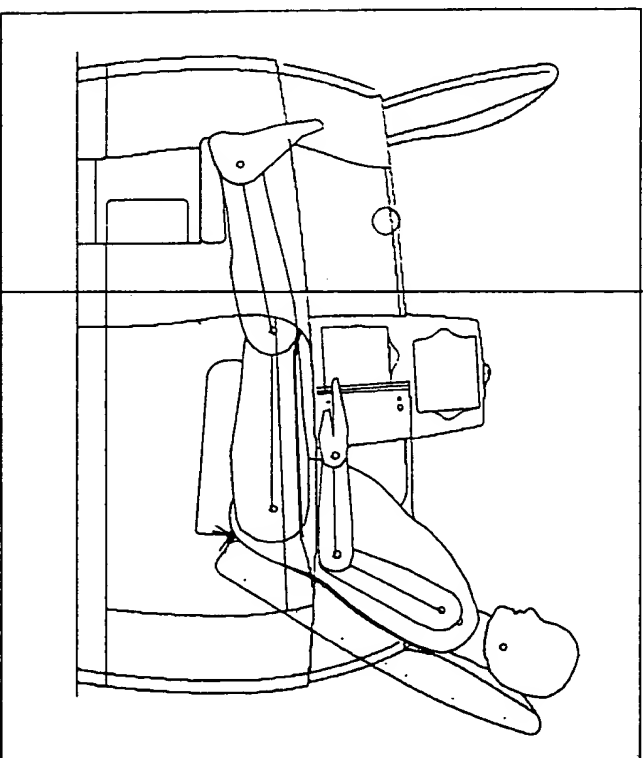
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5th percentile UK Female in reclined posture using the foot stool.



99th percentile US Male in reclined posture using the foot stool.

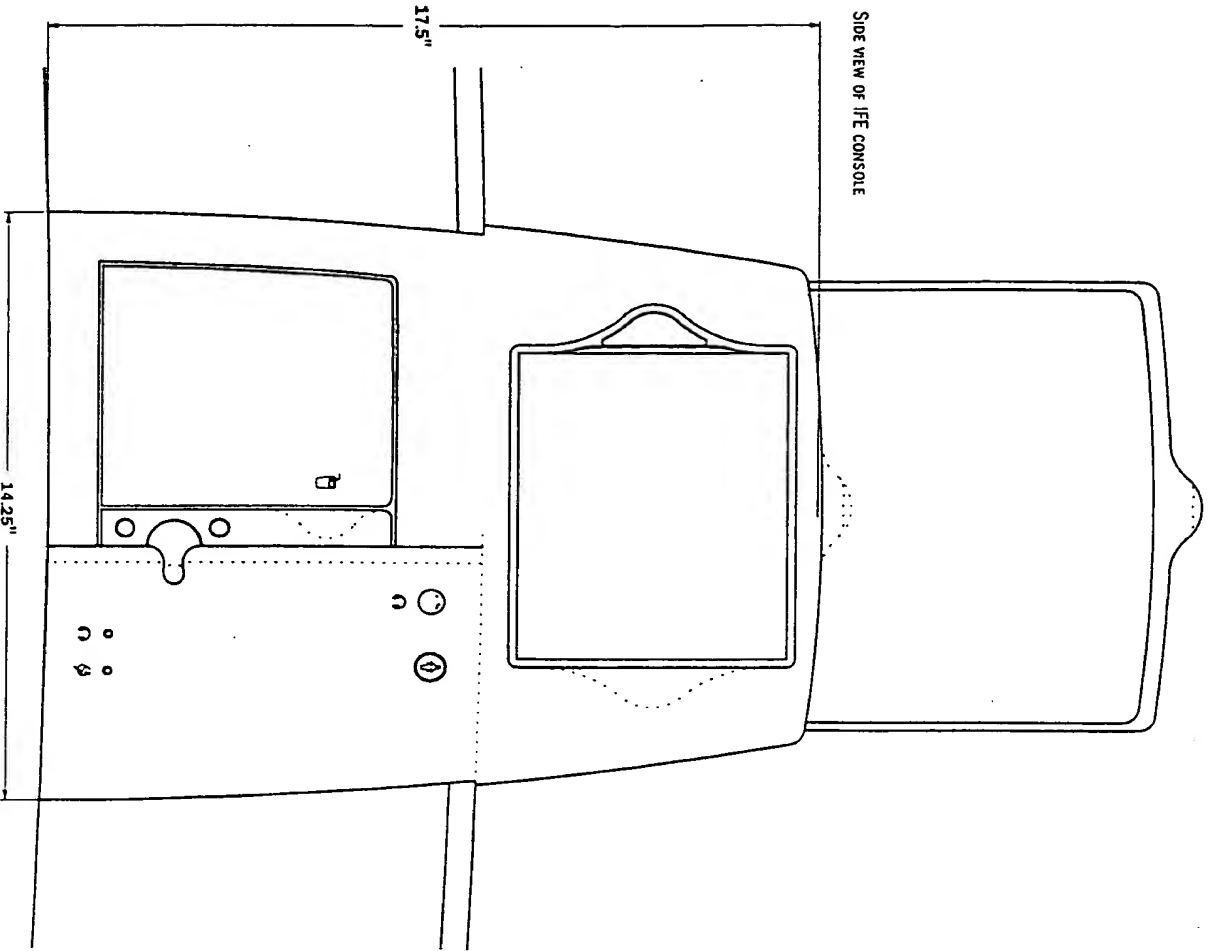
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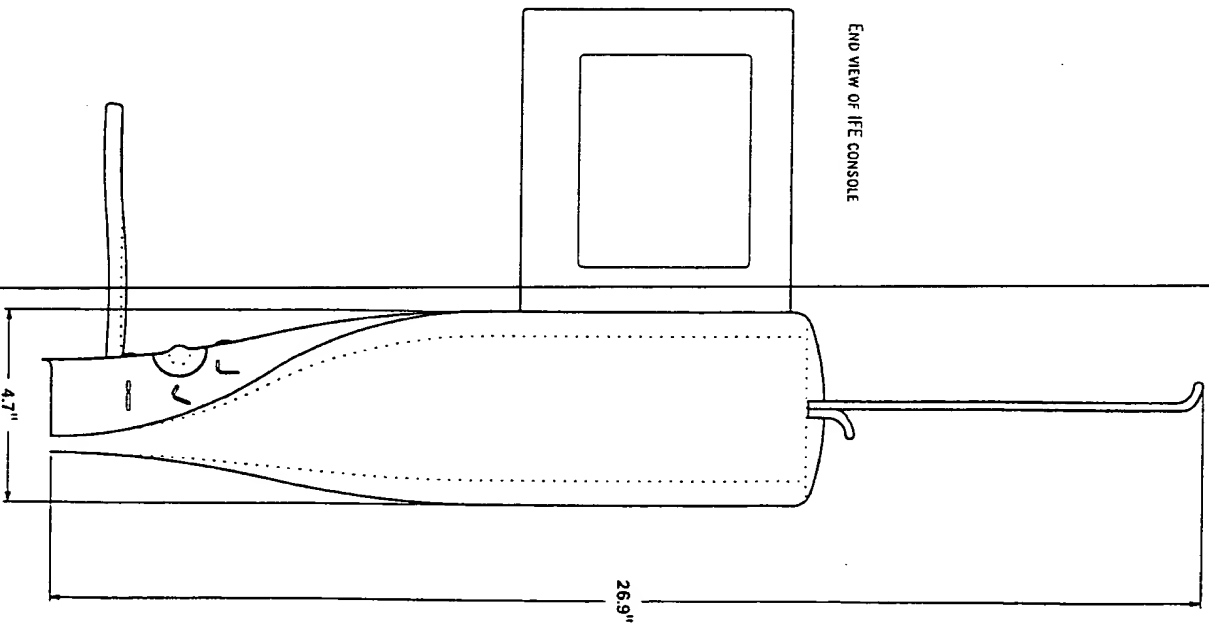
DETAIL VIEWS OF IFE CONSOLE (SCALE 1:2)

BA CREATIVE PITCH II CONTINUATION • 13 OCTOBER 1998

SIDE VIEW OF IFE CONSOLE



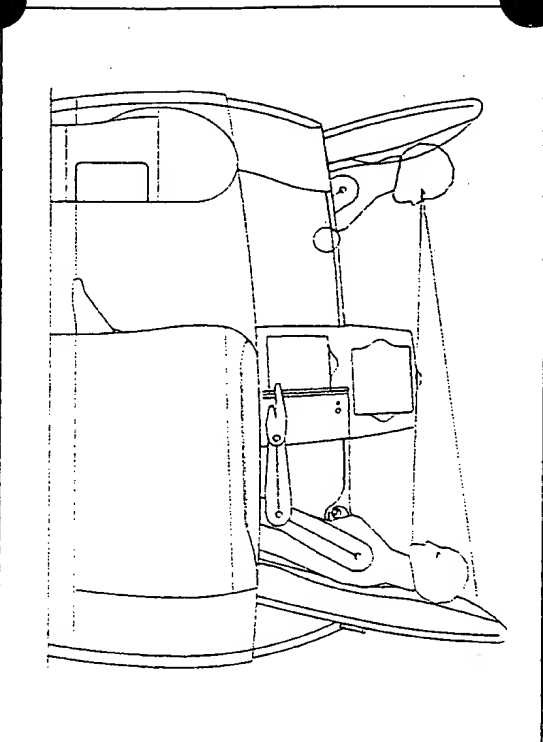
END VIEW OF IFE CONSOLE



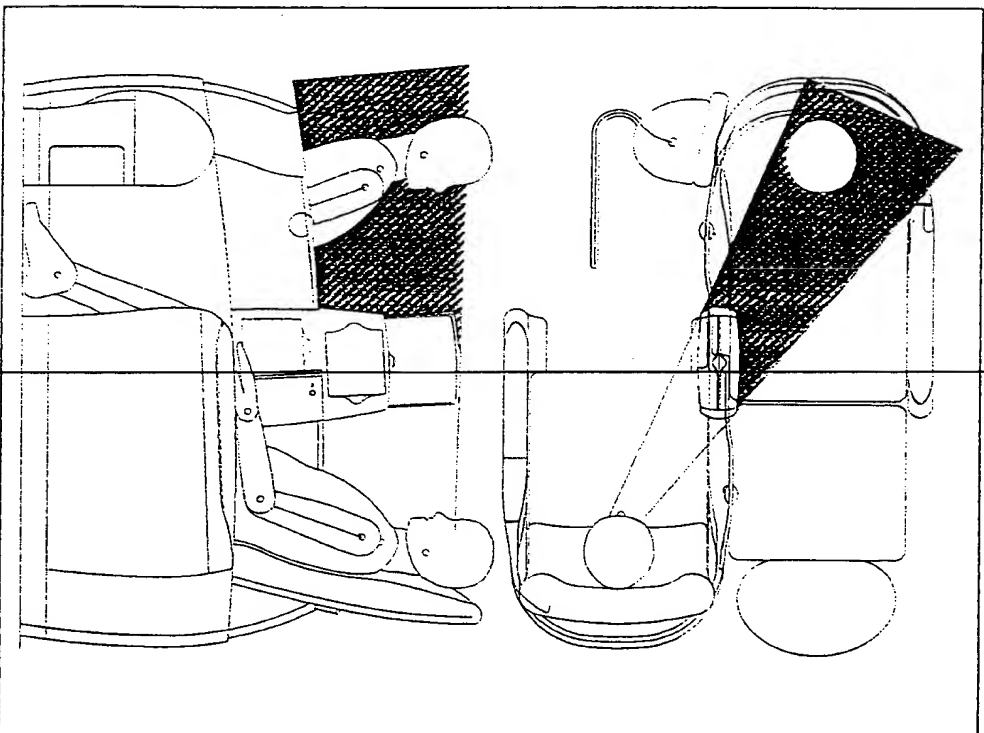
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the centre console height enables face-to-face communication for most customers.

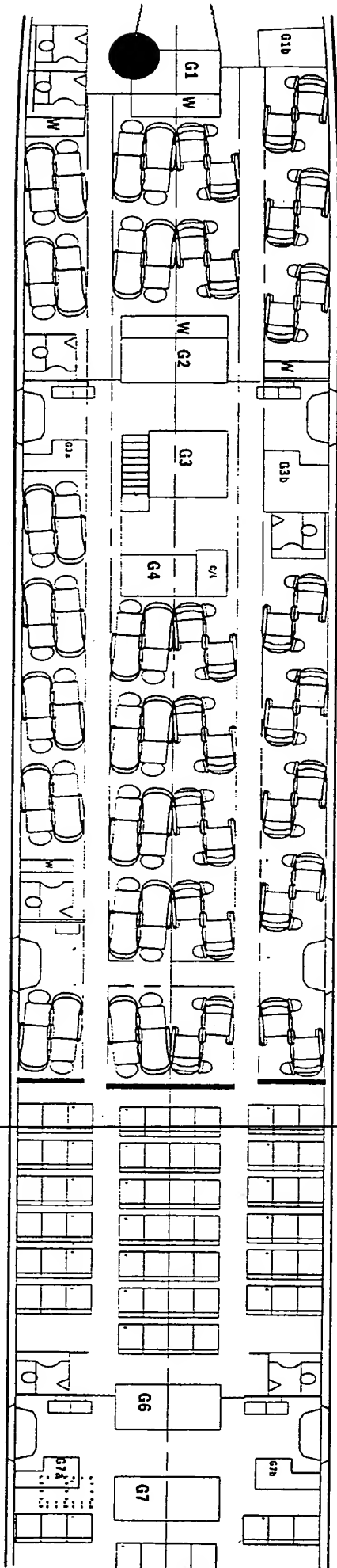


Raising the central privacy screen obscures the face of the person opposite giving a greater sense of privacy.



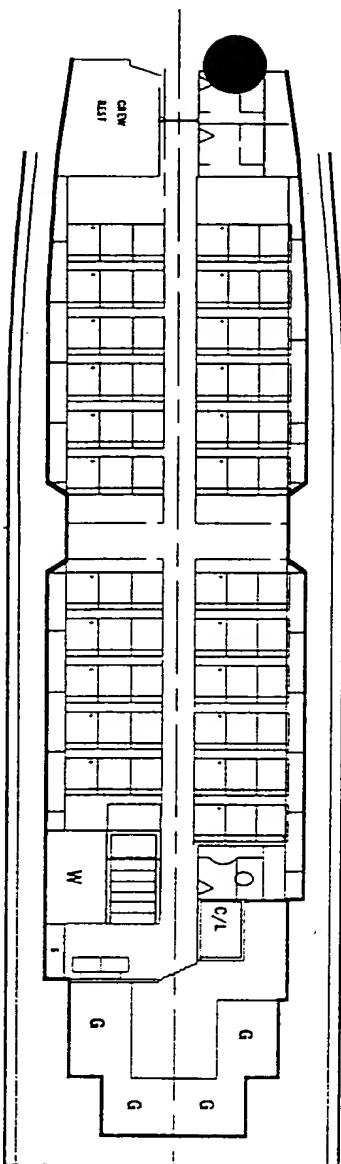
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**747 LAYOUT ONE:**  
 14F / 58J / 279M (with G7a change)  
 TOTAL = 351 Passengers.

remove G7a galley 2 M passengers  
 remove 1 toilet in zone B



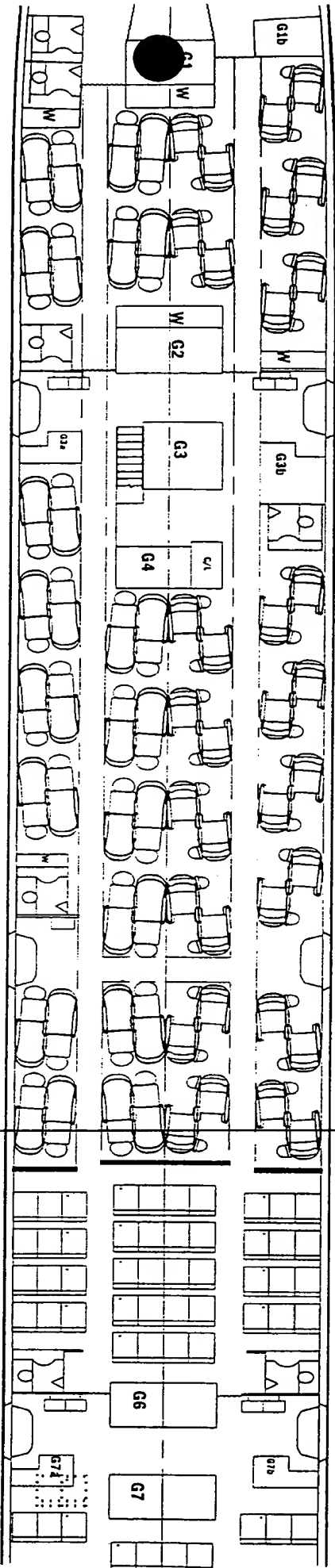
# 747 LAYOUT

EXISTING  
 14F / 55J / 332M  
 TOTAL = 401 PAX.  
 14F / 75J / 277M  
 TOTAL = 366 PAX.

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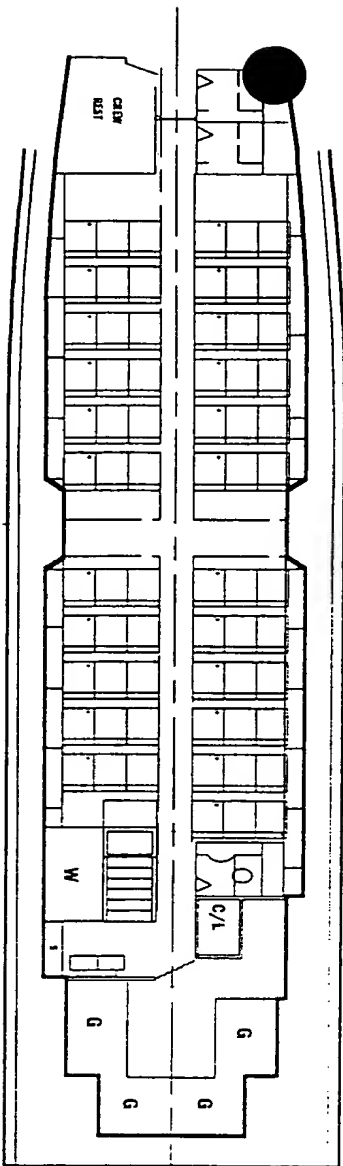
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**747 LAYOUT TWO:**  
 14F / 66J / 256M (with G7z change)  
 TOTAL = 336 Passengers

remove G7z gain 2 M passengers  
 remove 1 hotel in zone B  
 club hotel ratio 22 : 1

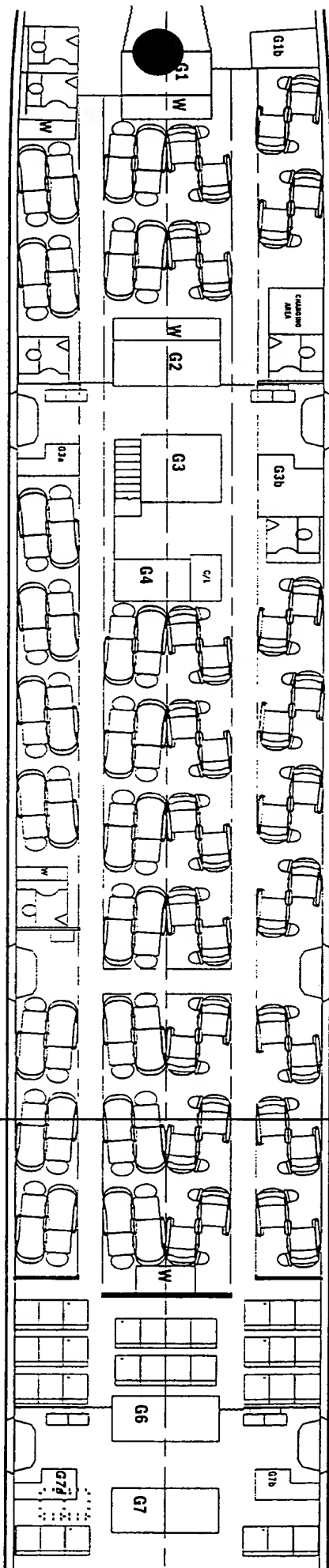


## 747 LAYOUT

**EXISTING**  
 14F / 55J / 332M  
 TOTAL = 401 PAX.  
 14F / 75J / 277M  
 TOTAL = 366 PAX.

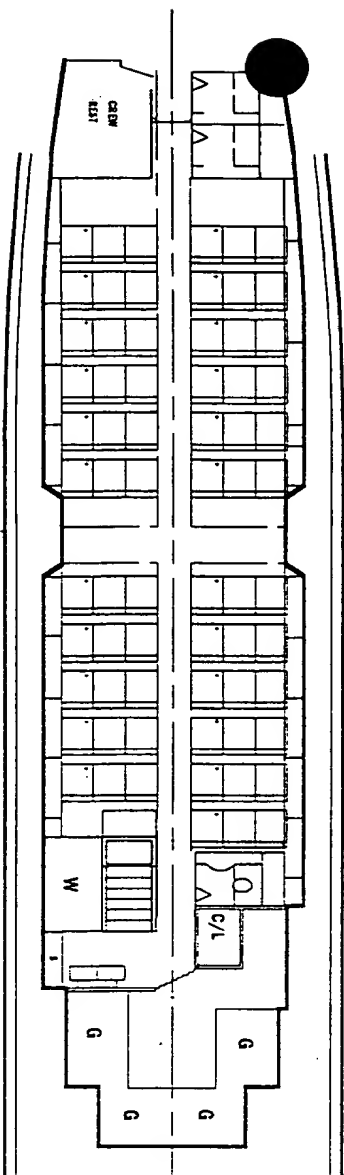
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**747 LAYOUT THREE:**  
 14F / 721 / 235M (with 07a change)  
 TOTAL = 321 Passengers.

remove 07a galleys 2 M passengers  
 changing area in zone B  
 remove 2 toilets in zone D

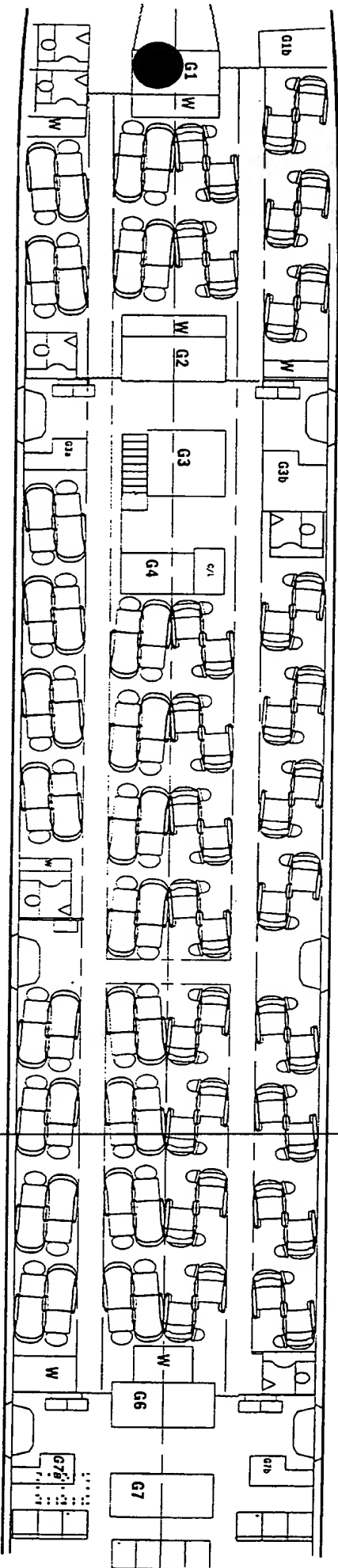


## 747 LAYOUT

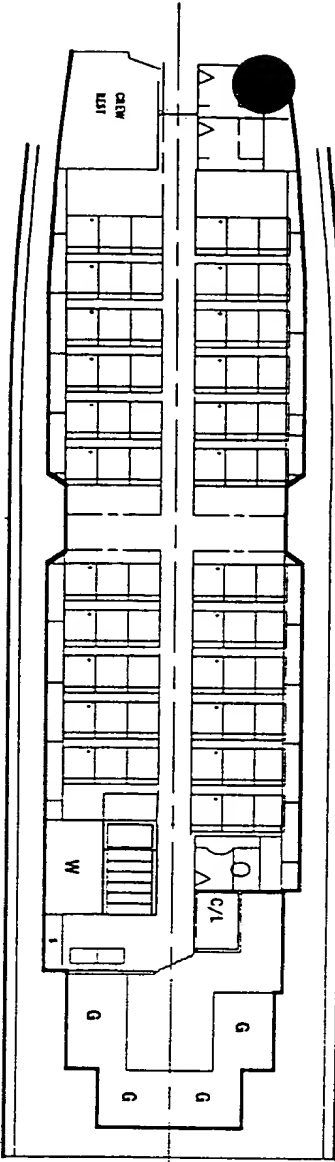
**EXISTING**  
 14F / 551 / 332M  
 TOTAL = 401 PAX.  
 14F / 751 / 277M  
 TOTAL = 366 PAX.

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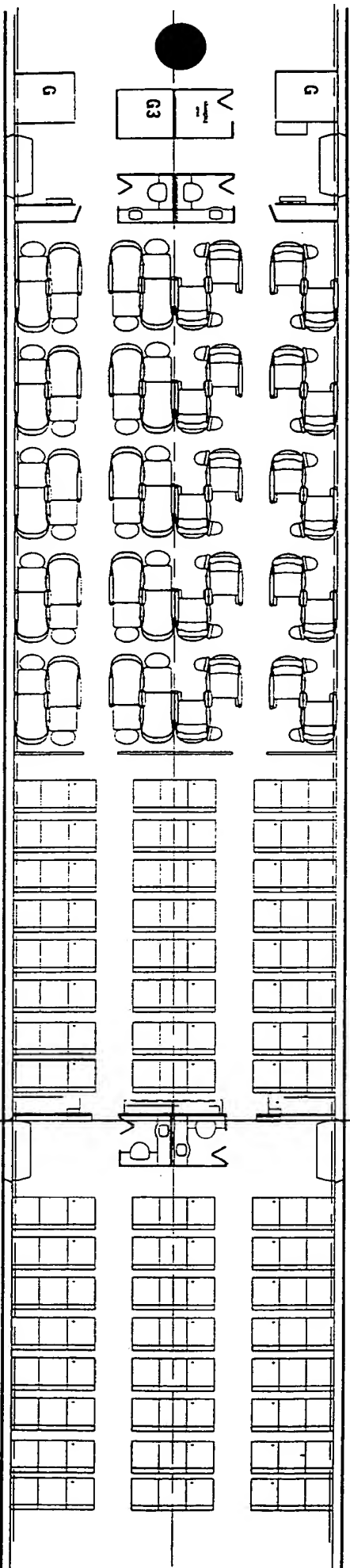
**747 LAYOUT FOUR:**  
 14F / 82J / 209M (with G7a change)  
 TOTAL = 305 Passengers.  
 remove G7a gains 2 M passengers  
 remove 1 toilet in zone D



**747 LAYOUT**  
 EXISTING  
 14F / 55J / 332M  
 TOTAL = 401 PAX.  
 14F / 75J / 277M  
 TOTAL = 366 PAX.

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777 LAYOUT ONE:  
14F / 40J / 197M  
TOTAL = 251 Passengers.

no major moment changes  
toilet by door 2 becomes changing room

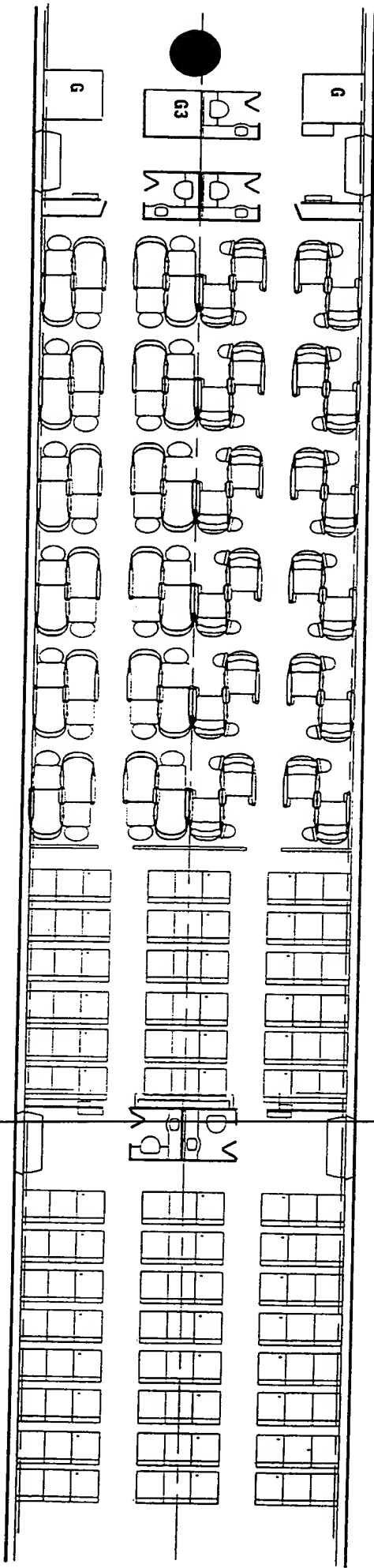
# 777 LAYOUT

EXISTING  
14F / 56J / 197M  
TOTAL = 267 PAX.

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**777 LAYOUT TWO**  
 14F / 48J / 179M  
 TOTAL = 241 Passengers.

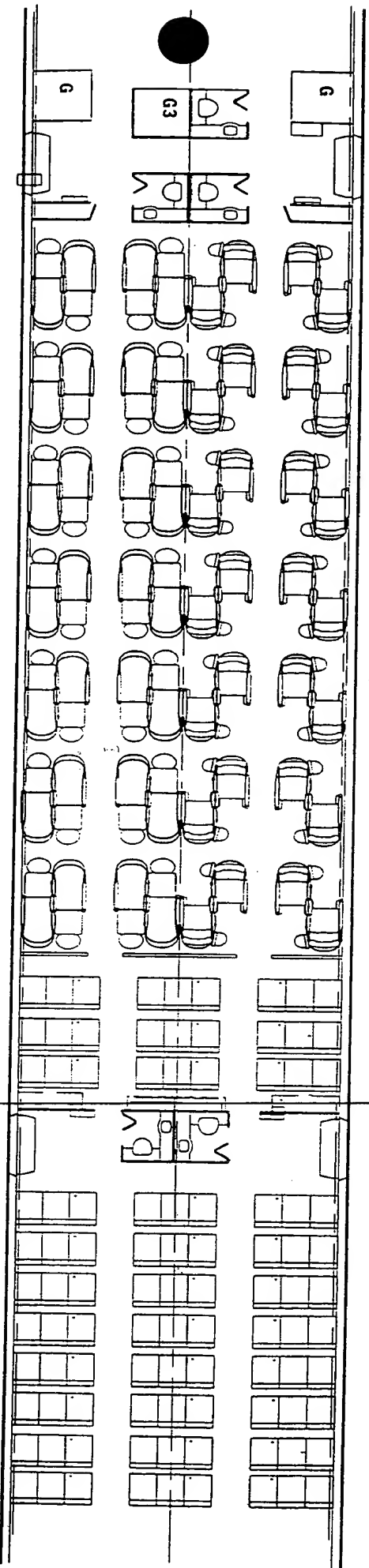
no major monument changes

# 777 LAYOUT

**EXISTING**  
 14F / 56J / 197M  
 TOTAL = 267 PAX.

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**777 LAYOUT THREE:**  
 14F / 56J / 154M  
 TOTAL = 224 Passengers.

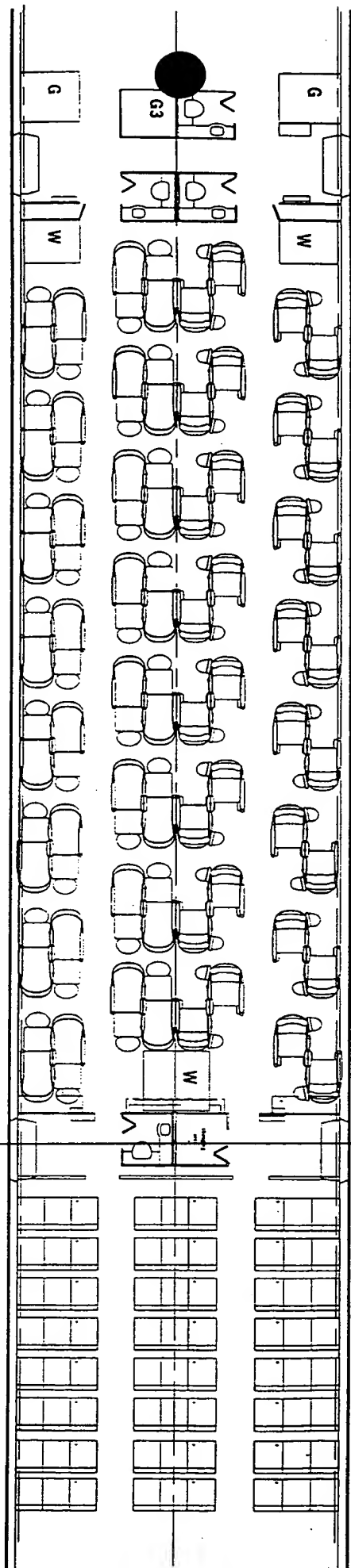
1 rear toilet removed replaced by 2 seats

# 777 LAYOUT

**EXISTING**  
 14F / 56J / 197M  
 TOTAL = 267 PAX.

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**777 LAYOUT FOUR:**  
 14F / 64J / 127M  
 TOTAL = 205 Passengers.

rear toilet removed replaced by 2 seats  
 toilet by door 2 becomes club  
 toilet by door 3 becomes changing area  
 05 could moved to gain 3M (18months)

# 777 LAYOUT

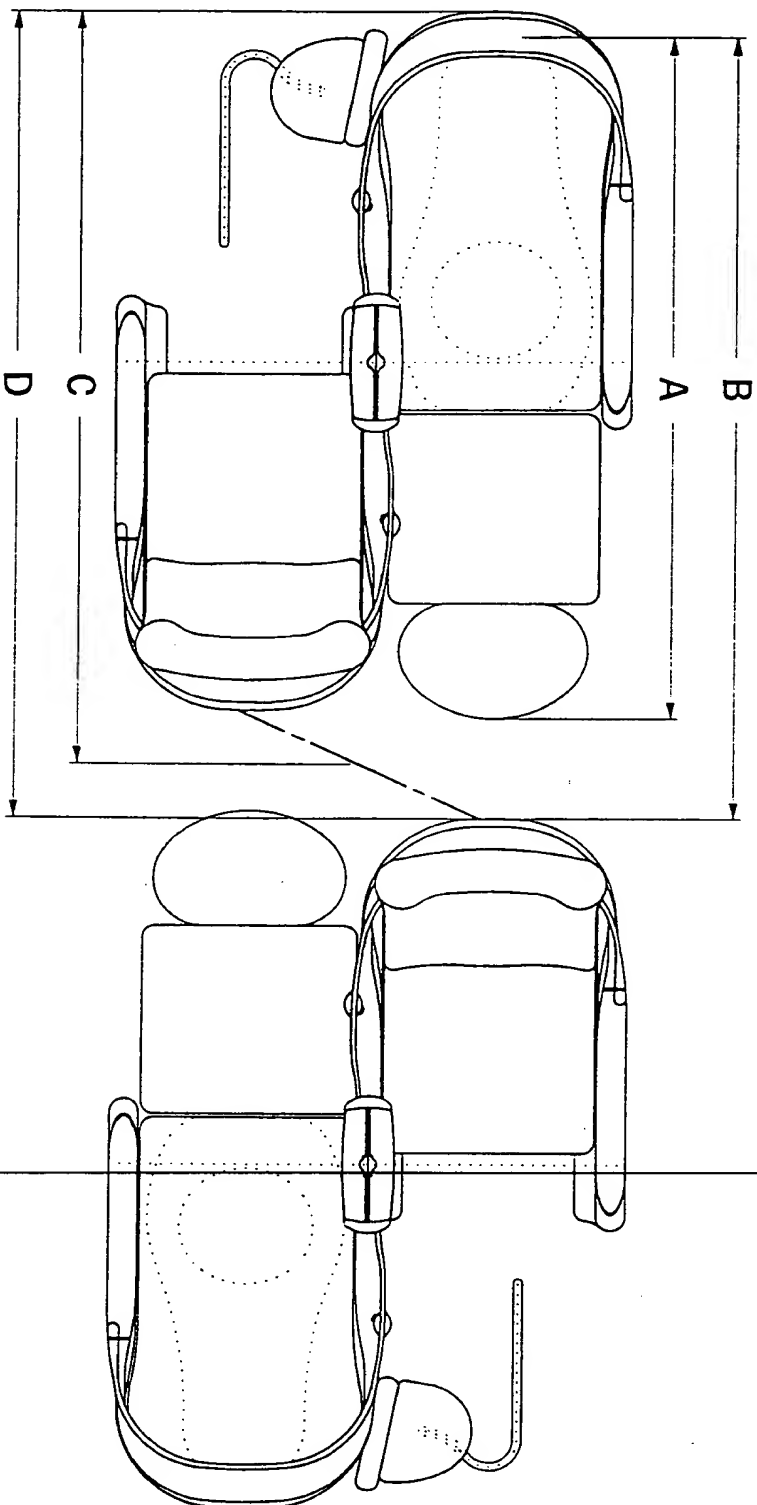
EXISTING  
 14F / 56J / 197M  
 TOTAL = 267 PAX.

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**A** 67" minimum bed length (5'7")

**B** • 77" maximum bed length (6'5")



**C** • 74" seat bay (6'2")

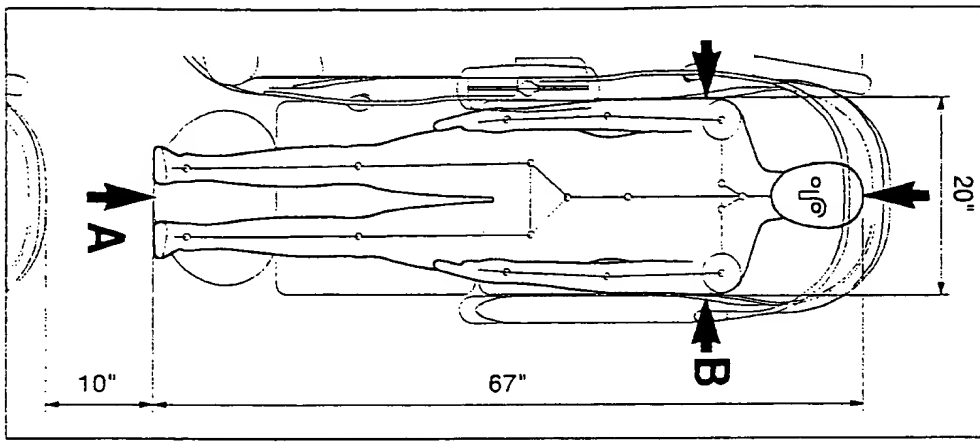
**D** • 79" seat pitch (6'7")

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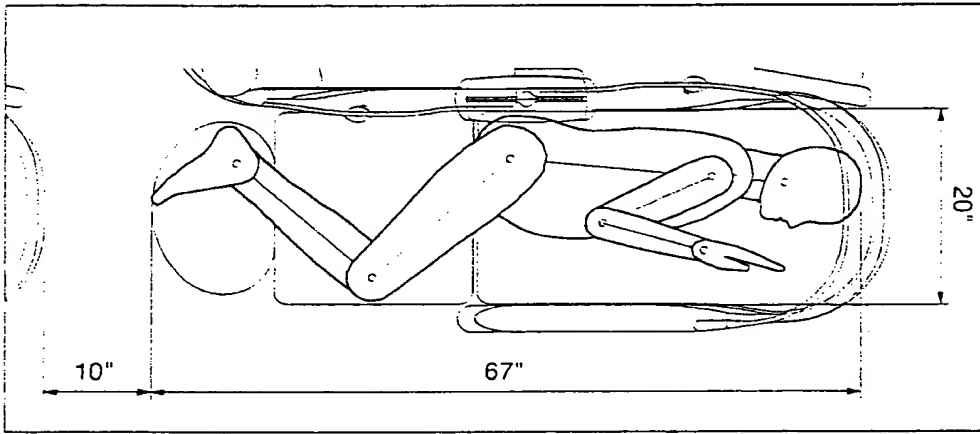
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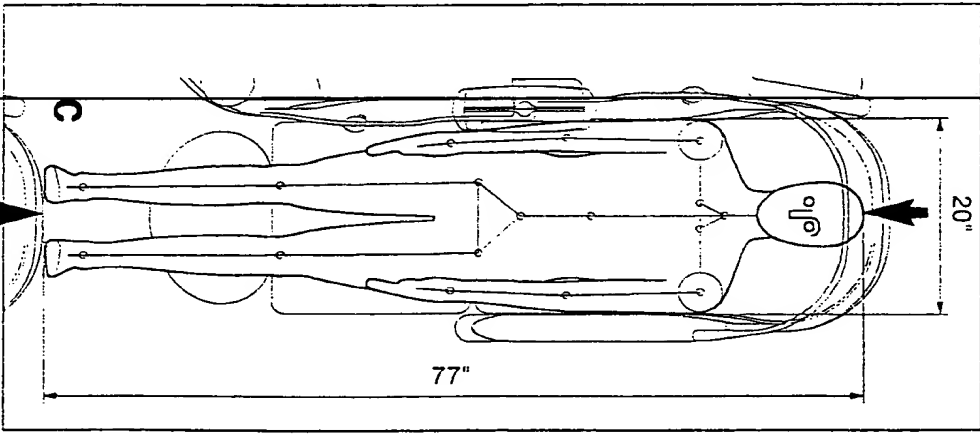
# SLEEPING ACCOMMODATION OF BA CLUB WORLD PASSENGERS



A 60% are no taller than the bed length  
B 72% are no wider than the bed width



77% can lie within the bed profile in this posture.



C 99.8% can lie out straight in the space available

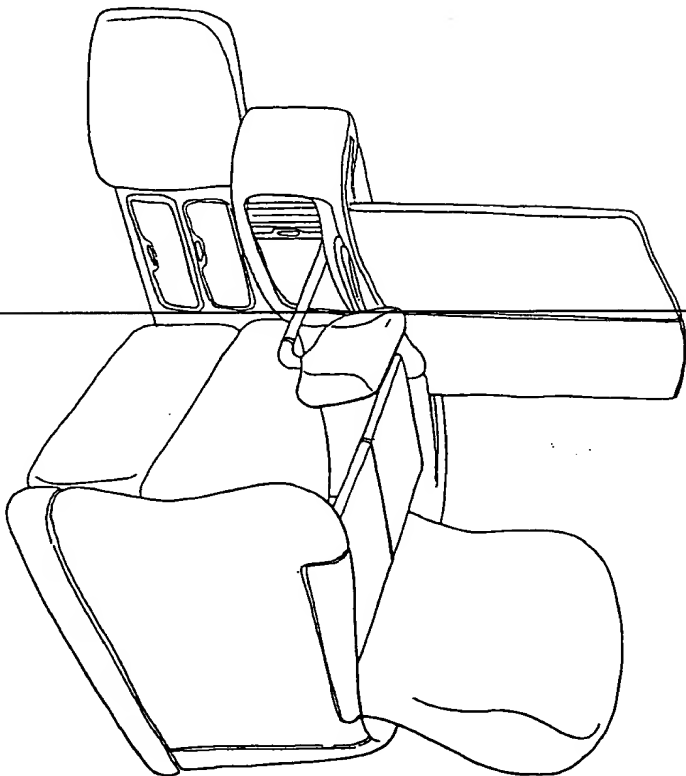
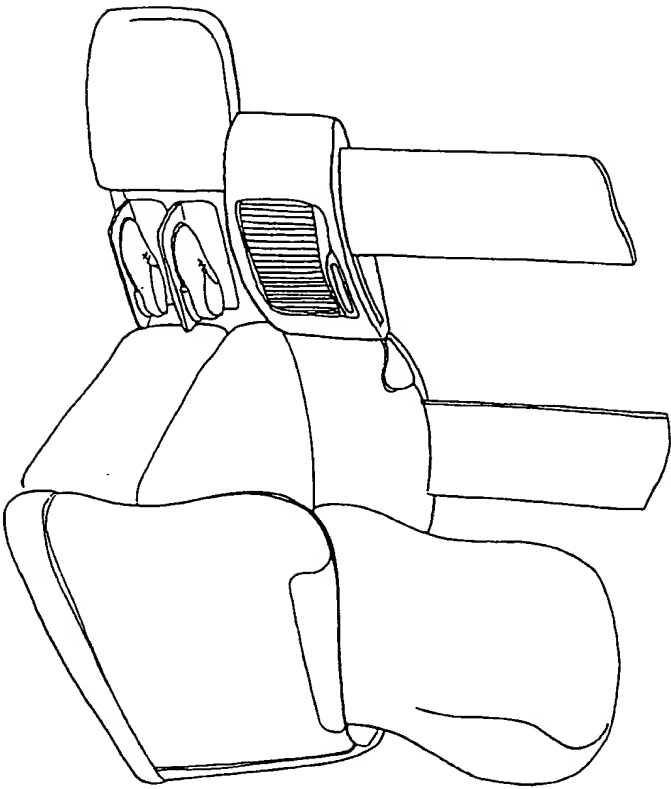
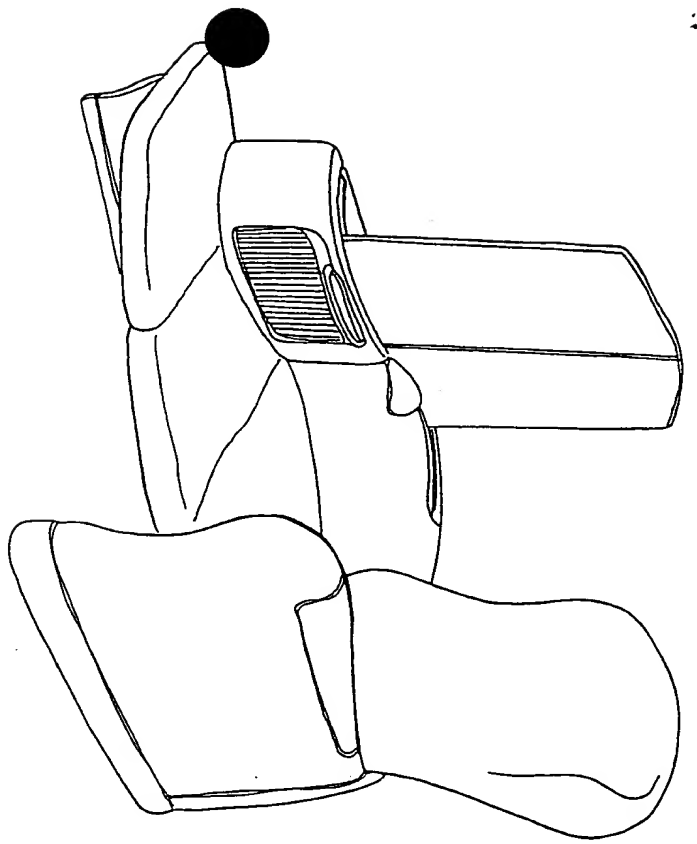
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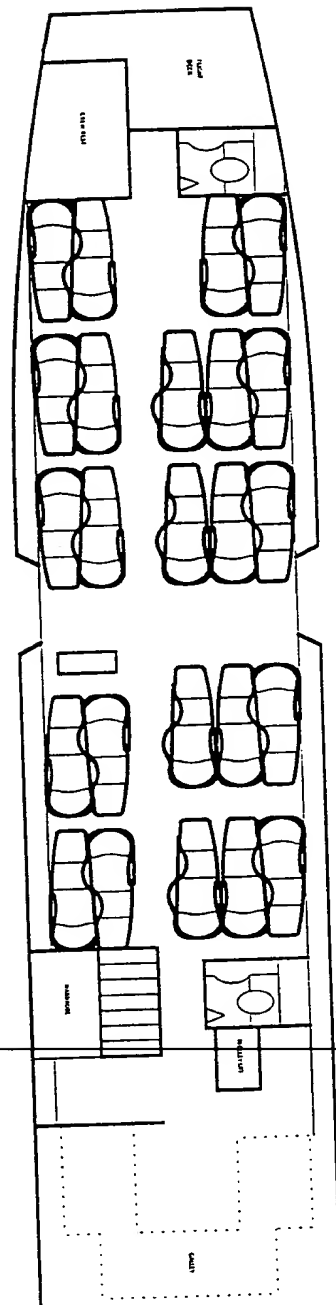
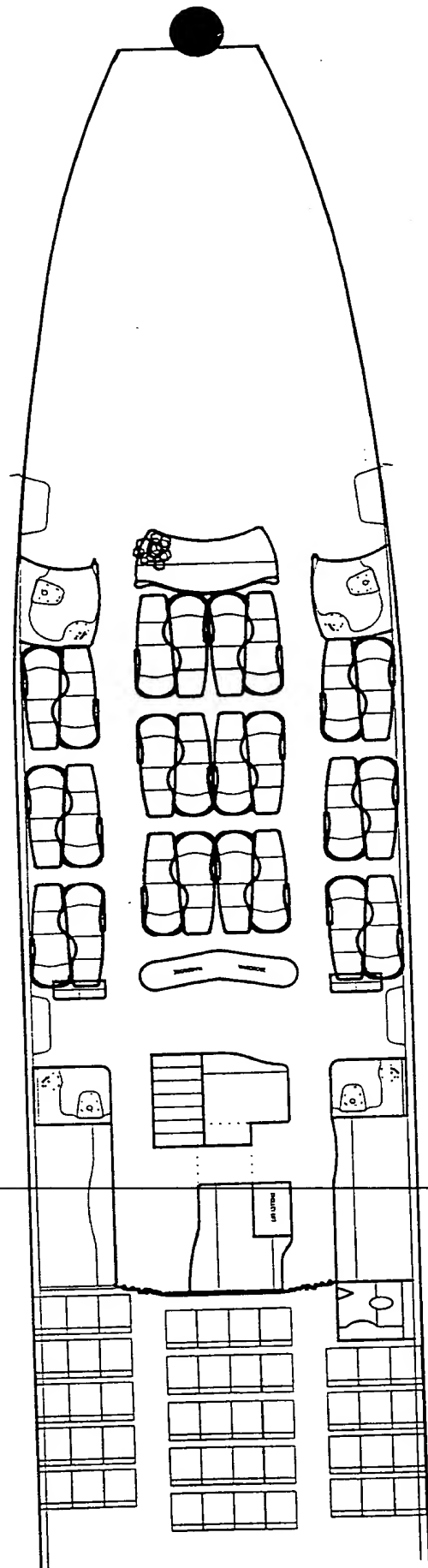
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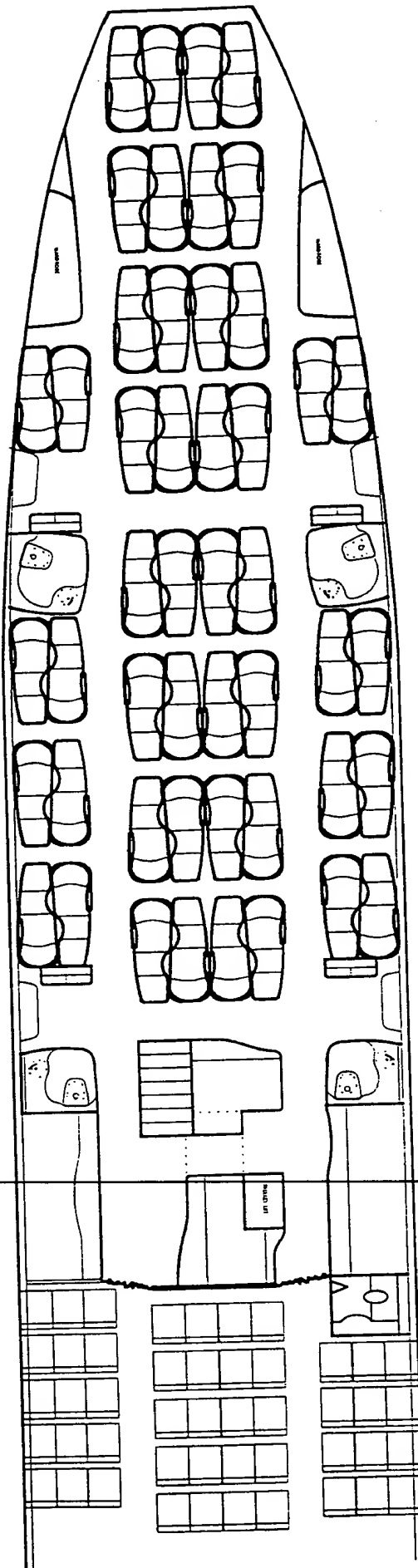
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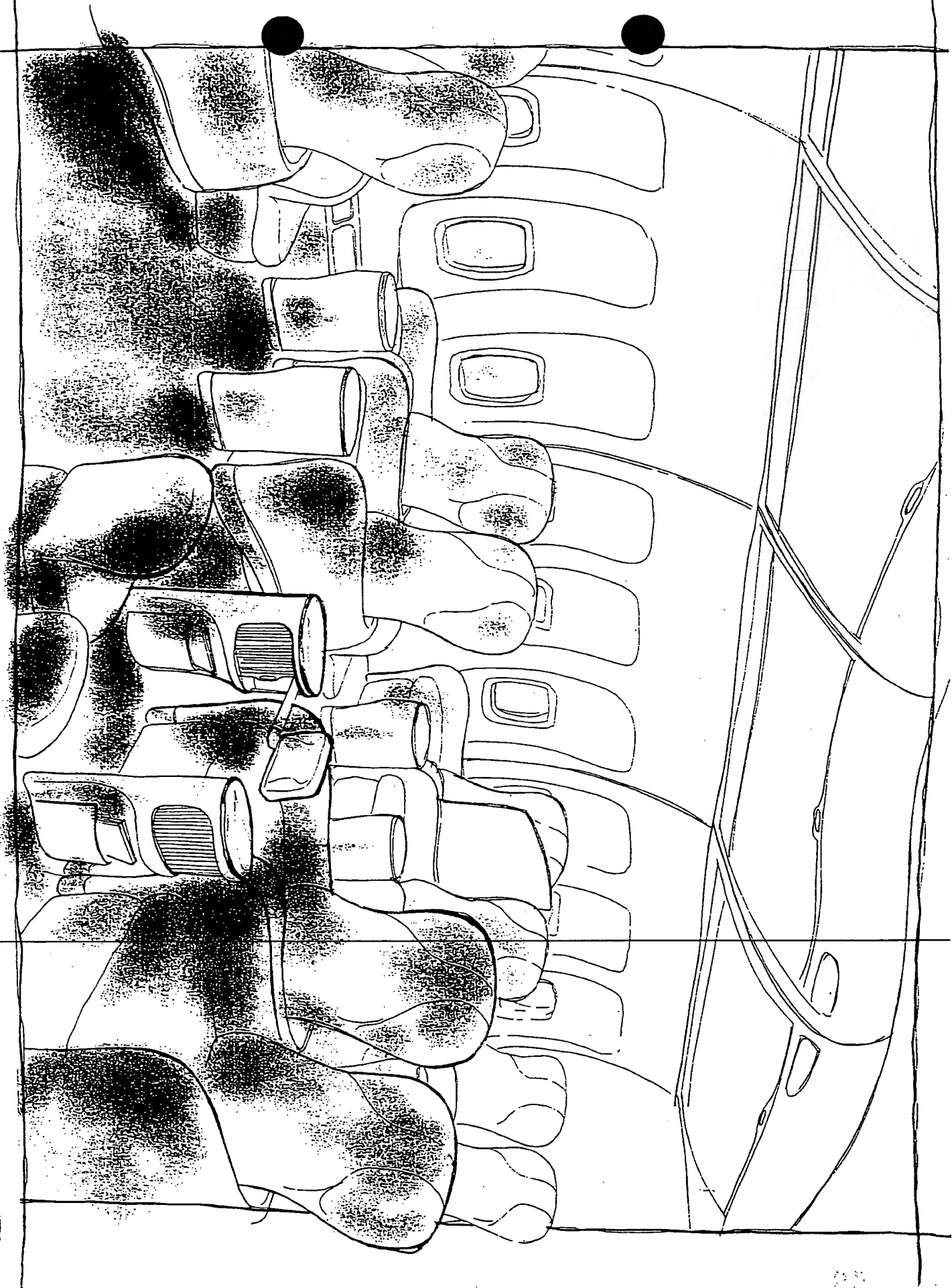
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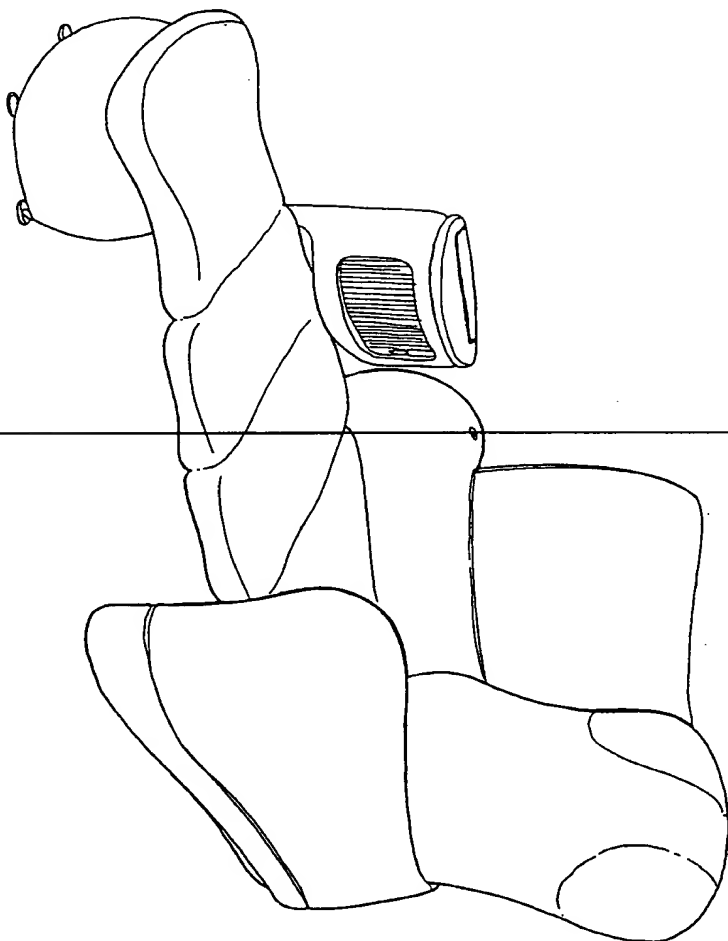
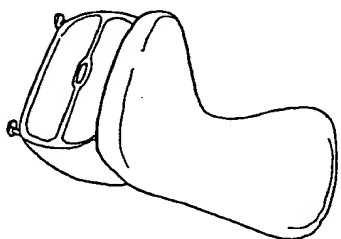
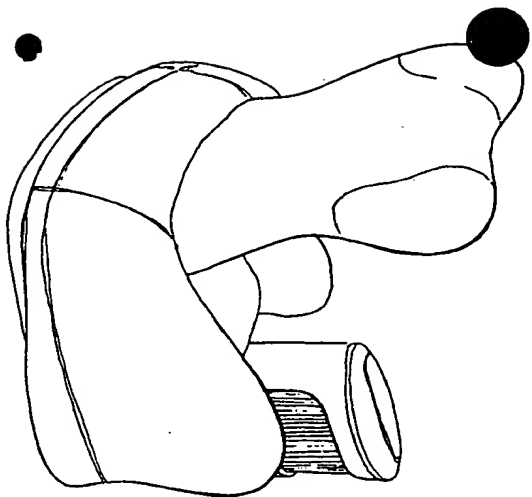
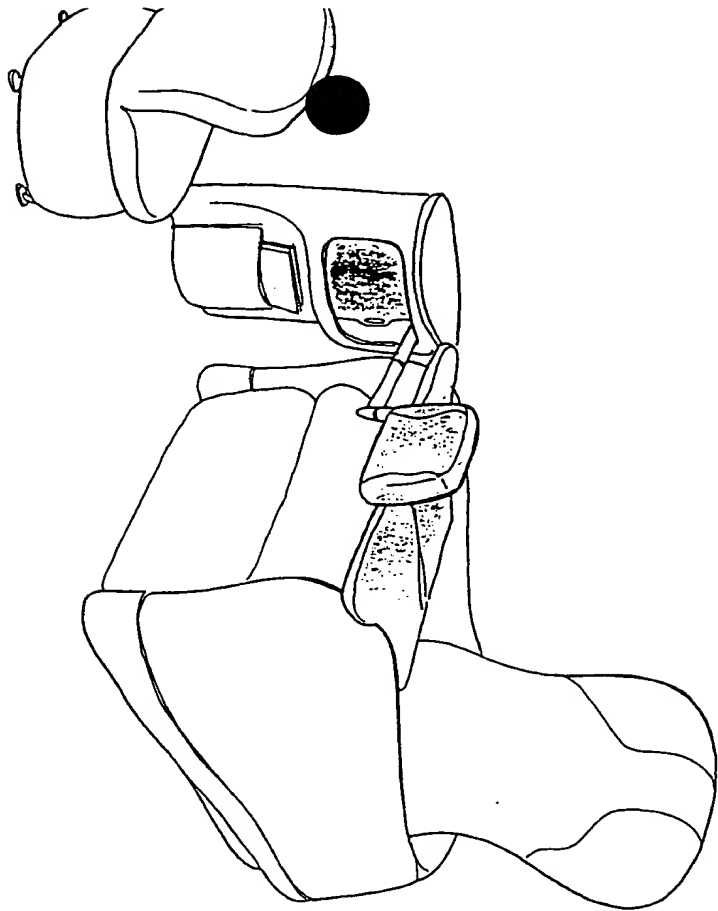
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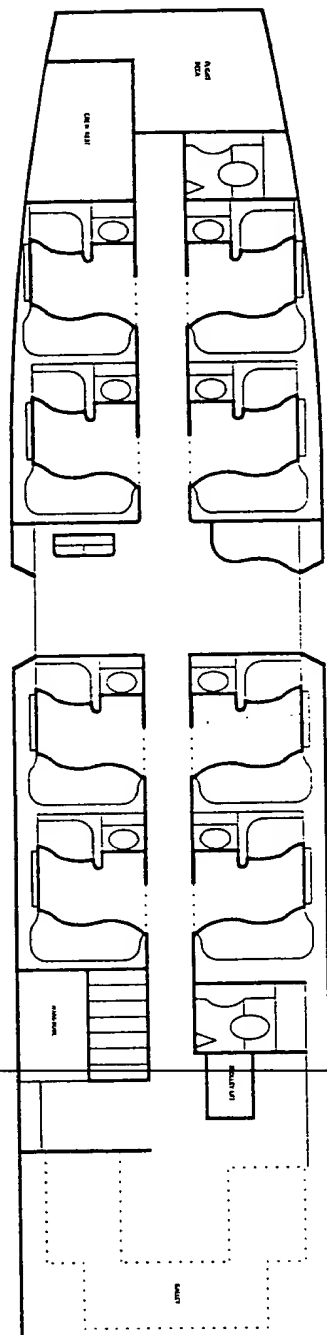
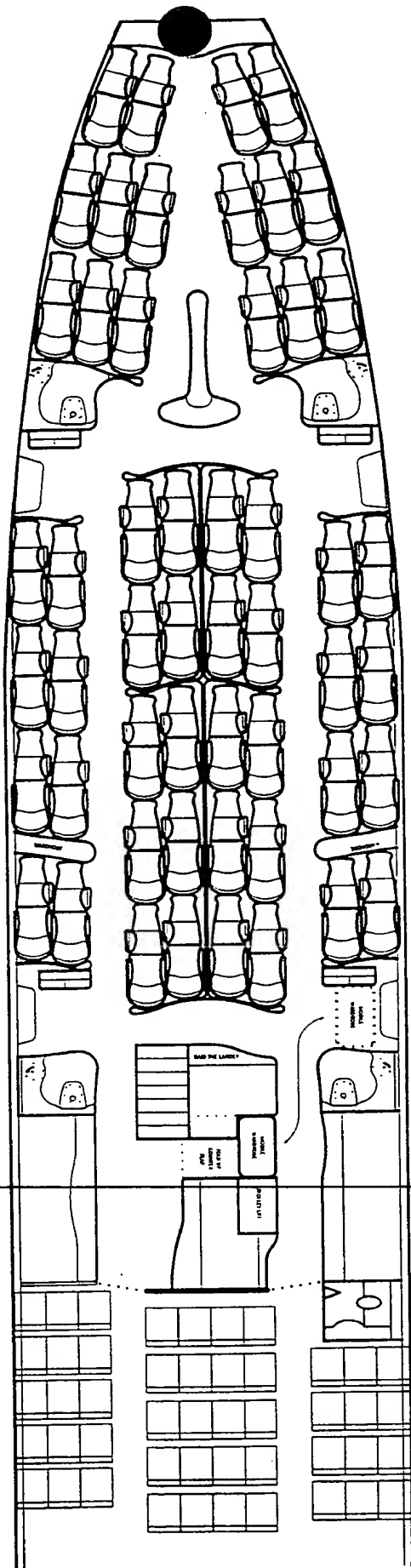
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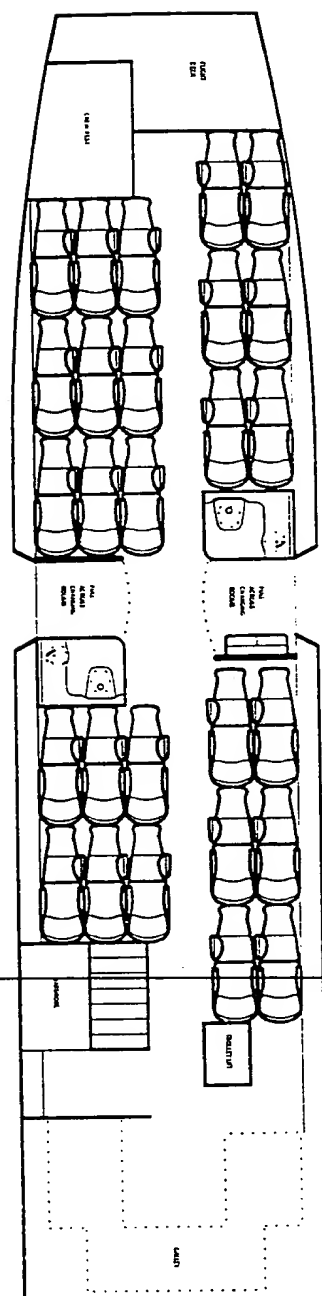
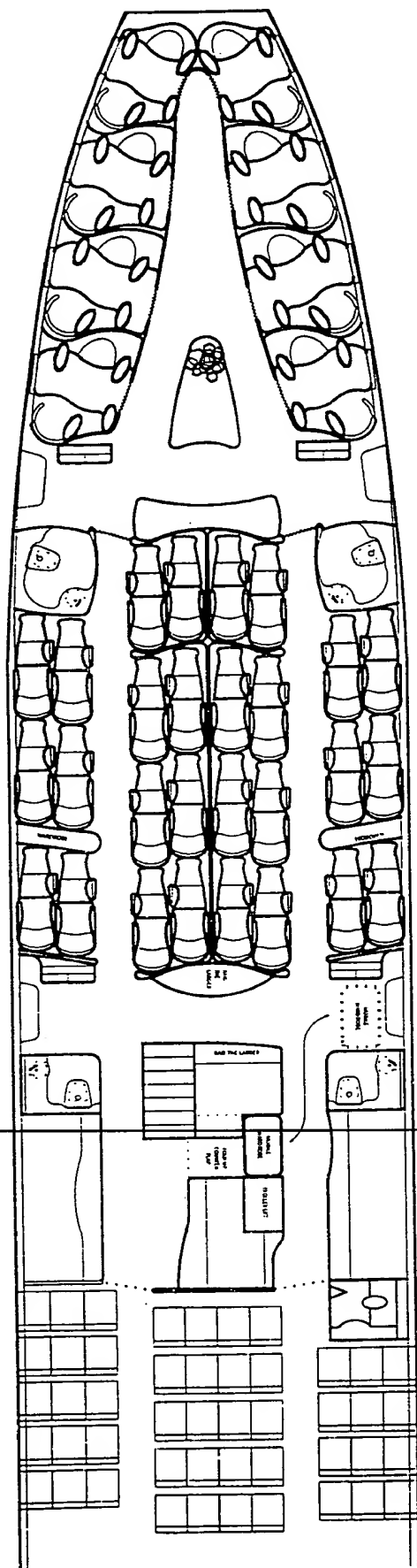
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